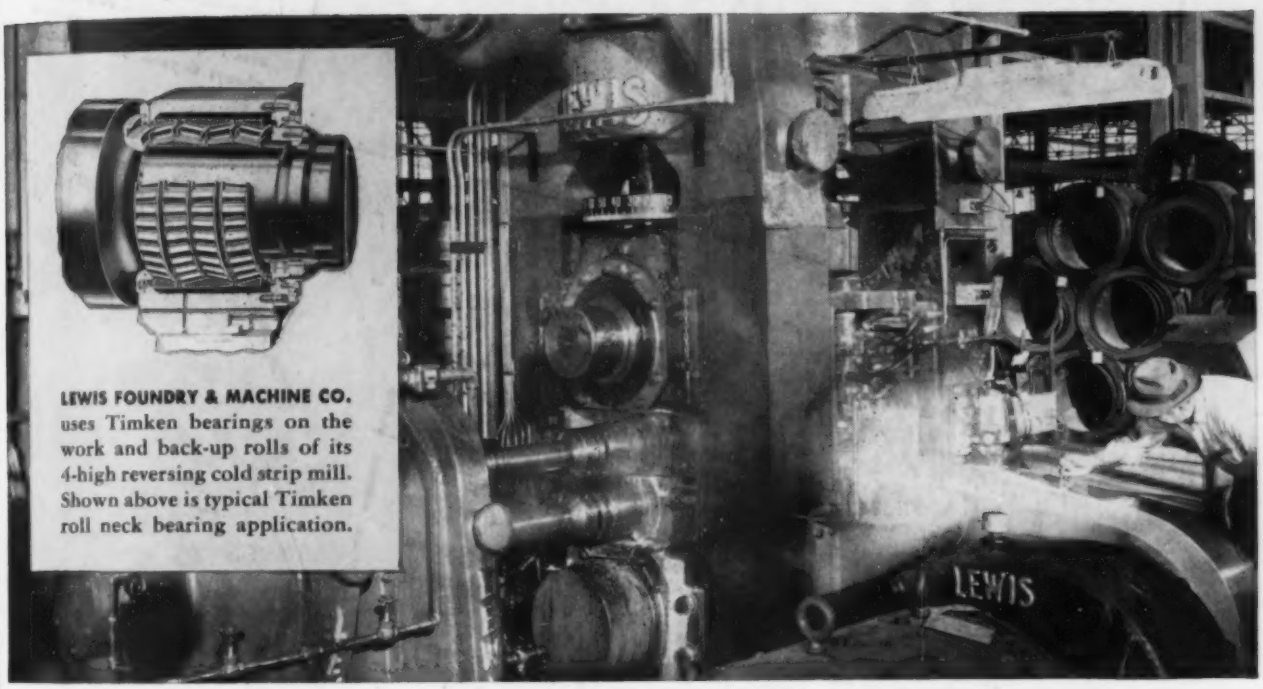
A CHILTON PUBLICATION

the Iron Age

E NATIONAL METALWORKING WEEKLY July 24, 1952

TENTS PAGE 2



LEWIS FOUNDRY & MACHINE CO. uses Timken bearings on the work and back-up rolls of its 4-high reversing cold strip mill. Shown above is typical Timken roll neck bearing application.

7 ways TIMKEN® bearings help Lewis strip mill strip costs

TIMKEN® bearings on the work and back-up rolls of this Lewis 4-high reversing cold strip mill cut costs 7 ways:

1) Timken tapered roller bearings take both radial and thrust loads in any combination. No special thrust units are required, chuck mountings are simpler and more compact, weight is minimized.

2) Mill can be stopped and restarted without altering or relieving screw-down pressures. Scrap loss caused by loss of gauge is eliminated.

3) Timken bearings have lower starting resistance, permit the mill to accelerate more rapidly. Skidding or scuffing between work and back-up rolls is reduced.

4) The mill can be adjusted quickly under full load at low operating speeds and while reversing rolling directions.

5) Timken bearings permit use of economical grease lubrication. There's no loss of lubricant during roll changes, rolls can be changed faster. Complicated lubricating systems and large oil reservoirs are eliminated.

6) Less leakage of lubricant with Timken bearings because closures are more efficient with grease lubrication.

7) Back-up rolls can be driven easier on Timken bearings. Less hydraulic accumulator pressure is needed.

Besides the 8 Timken bearings on the work and back-up rolls, a total of 14 Timken bearings are also used on the motor screwdowns, tension reels, combination drive and pinion stand of the Lewis mill. It will pay *you* to specify Timken bearings for all your new and existing equipment. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN

TRADE MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

Worm gearing—universal in its application—affords advantages for almost every power transmission job. For worm and gears—in standard sets or special requirements—you can always depend on Cleveland.

Flue-dust fluffer has CLEVELAND drive

THIS tumbling barrel fluffer mixes ore-laden flue dust with water for sintering at an important steel mill. Since proper mixing of these ore fines affects the degree of sinter porosity, the fluffer must be powered by a smooth and dependable drive. To meet these requirements, the builder chose a Cleveland worm gear speed reducer.

And no wonder! Cleveland drives have been job-proven for forty years in the steel, as well as in other supporting industries, such as the sintering plant above.

Day in, day out, you'll find Clevelands at work operating conveyors, picklers, mill cranes, compressors and other equipment—in fact, wherever a right angle drive is desired. For steel men know from experience that a safe and sure Cleveland never fluffs a job.

For full information on the complete Cleveland line, write now for new Catalog 400. The Cleveland Worm and Gear Company, 3752 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

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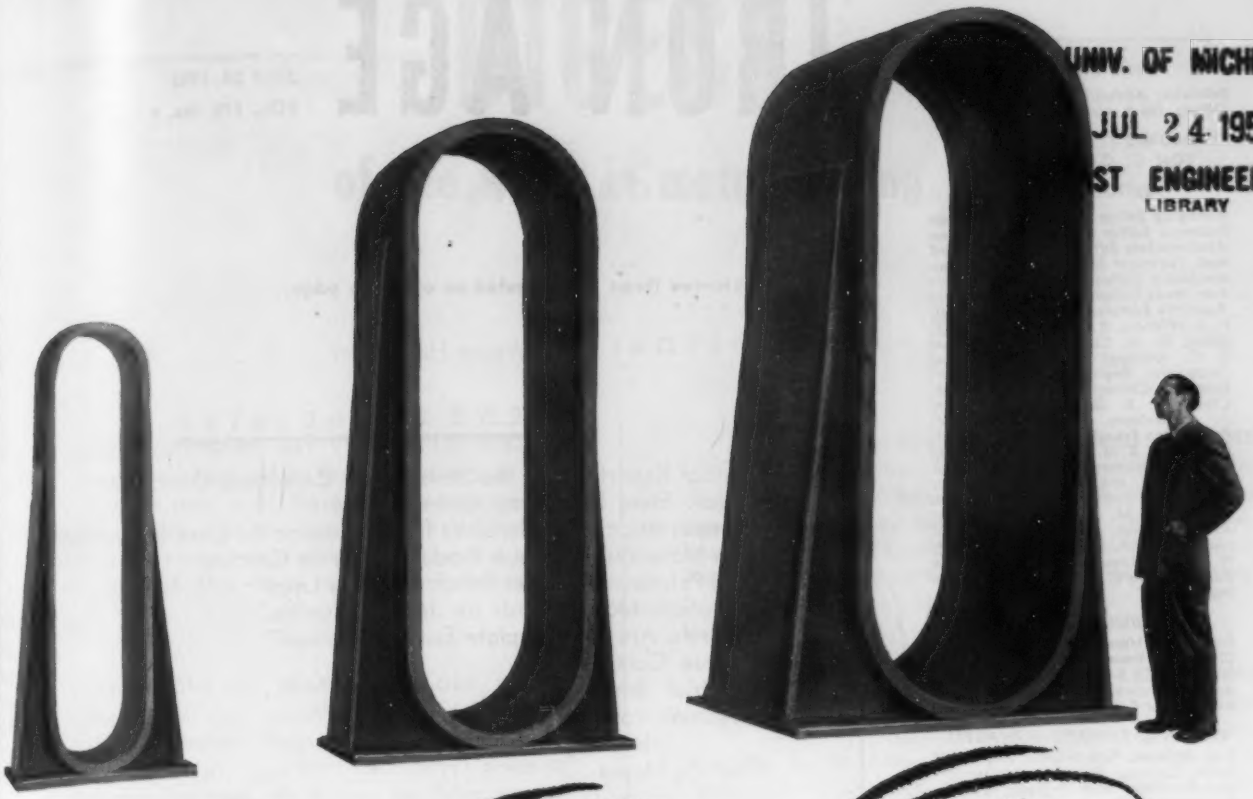
Height, 6 ft, 5 in.
Width, 1 ft, 5 in.
Base, 1 ft, 5 in. x 3 ft
Thickness, 1½ in.
Weight, 1509 lb
Height, 9 ft, 8 in.
Width, 2 ft, 6 in.
Base, 2 ft, 6 in. x 4 ft, 8 in.
Thickness, 3 in.
Weight, 7778 lb
Height, 12 ft, 1 in.
Width, 2 ft, 6 in.
Base, 2 ft, 6 in. x 4 ft, 8 in.
Thickness, 3 in.
Weight, 17,864 lb

Moulding-Press Frames Produced by Welding

These three moulding-press frames vary in height from 6 ft, 5 in. to 12 ft, 1 in., and in weight from 1509 lb to 17,864 lb. They were made in Bethlehem's Weldment Shop, and were produced by forming and welding heavy plate steel.

Advantages of Bethlehem Weldments

Bethlehem Weldments offer these worthwhile advantages to manufacturers of machinery and machine parts:

1. ECONOMY. Bethlehem Weldments eliminate excess weight, without any sacrifice of rigidity. This saving in weight frequently means that the finished machine can be turned out at lower cost.

2. VERSATILITY. Bethlehem Weldments can be produced in a wide range of sizes, either as simple parts or intricate assemblies.

3. FLEXIBILITY. Designers of machinery can plan freely, because the steel from which these weldments are made can be bent, pressed or otherwise shaped prior to welding, without damage to the physical structure of the steel.

4. USED SINGLY OR IN COMBINATION. Although frequently used alone, Bethlehem Weldments can also be combined with forgings or castings.

Like to have a Bethlehem representative call to discuss ways in which you may be able to use weldments effectively? All you need do is contact the nearest Bethlehem office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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★ BETHLEHEM STEEL ★

BETHLEHEM WELDMENTS

IRON AGE

JULY 24, 1952
VOL. 170, No. 4

THE IRON AGE

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DIGEST

of the week in metalworking

CAN CONSUMERS GET STEEL AFTER STRIKE? PAGE 51

Purchasing agents will be hard pressed to find steel when the strike ends. The potential supply sources, mills, warehouses, conversion and foreign steel, hold out little hope. Military and atomic energy customers will get first crack at all steel produced. May use up all of first month's output.

STEEL COMPANY BRASS SPELL OUT STAND PAGE 53

Shirt-sleeved steel executives appeared before a USW International Wage Policy Committee meeting in Pittsburgh early this week to explain the industry's proposals to end the strike. They were well received, but failed to make any visible change in the committee's stand on settlement terms.

INCREASE IN CRYOLITE SUPPLY SCHEDULED PAGE 55

Cryolite is vital to aluminum production and the only natural deposit is being depleted. Doubling aluminum capacity places huge demands. Washington is backing a huge expansion in synthetic production, subsidizing mine output. Industry is working hard on reclamation from old pot linings.

STEEL SHORTAGE HITS MIDWESTERN WORKERS PAGE 70

Steel-hungry industrial towns in the Midwest have begun to feel the full effects of the long-lasting steel strike. The predominantly General Motors city of Flint has 15,000 idle. Chevrolet was the first to close its plant. GM is distributing vacation pay to ease workers' financial woes.

WASHINGTON IS PRESSING DISPERSAL PLANS PAGE 75

The government is again pushing decentralization of industrial facilities. Always a pet NSRB scheme, it had to take a back seat after Korea to make way for fast defense production and expansion. Now it is being dusted off again, and Washington has new methods to pressure industry.

CANADA STARTS TO FEEL U. S. STEEL STRIKE PAGE 81

Shutdowns caused by the U. S. steel strike have started in Canada. Auto plants have been badly hit. Many have pushed up vacation schedules to keep from running completely out of steel. Plants will apparently, stay closed until new supplies are available, as workers were told to stay home.

NO STEEL SHORTAGE FOR TOOL BUILDERS PAGE 82

The steel strike is not proving a major headache for machine tool builders. High priorities and a growing order cancellation rate have built up their metal reserves. Warehouses have not been drained of necessary types of steel. And vacation periods are helping to hold demand low in July.

SAVE ALLOY WITH FERRITIC ELECTRODES PAGE 93

Savings in strategic alloys of about 85 pct have been made by using ferritic electrodes instead of austenitic electrodes by the Army. Use is on military vehicles, up to 5/8-in. material thickness. Welds pass strict ballistic tests. Electrodes are low hydrogen with alloy elements in coating.

USES FOR INDUSTRIAL COATED ABRASIVES PAGE 98

A wide variety of types of abrasives and equipment is made for the metalworking industry. Formed backup wheels, hole deburring equipment, machines for pipe ID polishing, are among interesting devices available. Uses include offhand tool grinding, sheet and strip polishing, casting cleaning.

BENEFITS OF AUTOMATIC ACID BRIGHT DIP PAGE 108

Higher unit output in less floor space has been achieved with a fully automatic acid bright dip processing unit. Capacity is 1 ton of small brass parts per hr. Only two men are needed to operate the machine. Control board permits the dwell time at any station to be set to a fraction of a second.

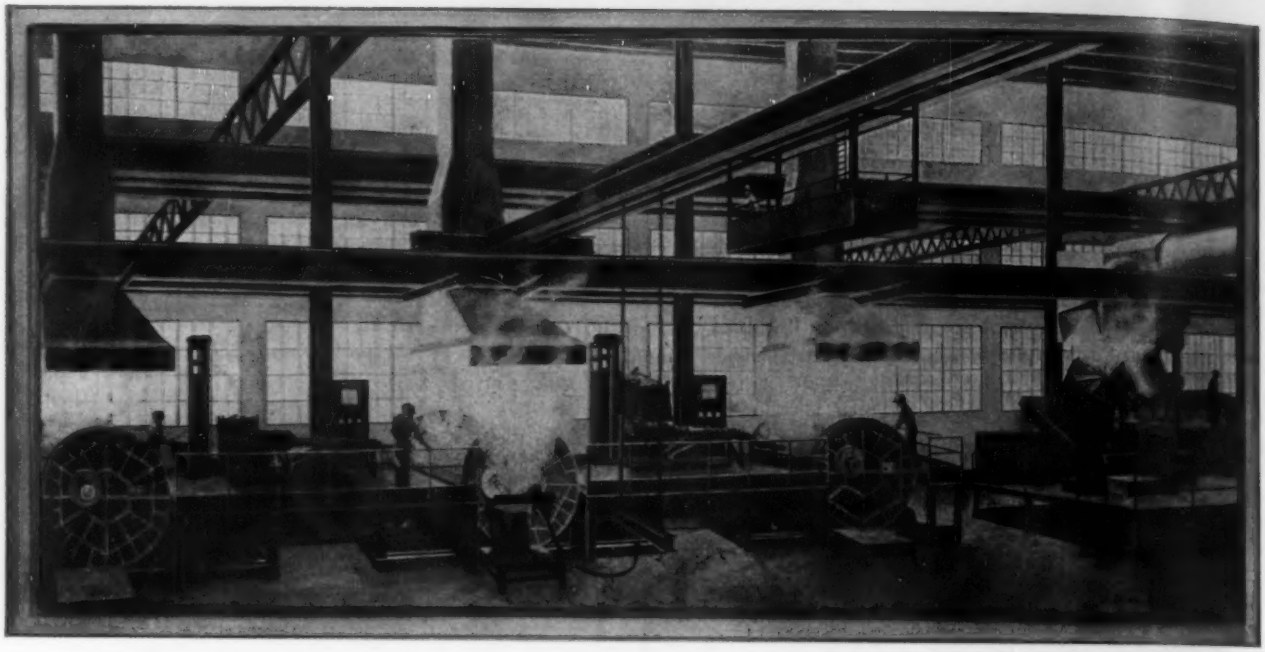
STEEL CONSUMERS DESPAIR OF SETTLEMENT PAGE 133

In the eighth week of strike the last vestige of optimism is leaving steel consumers. With early hopes of an agreement badly faded, manufacturers still operating are trying to piece out orders at warehouses. But they see no hope of getting the big tonnages they must have to keep going.

MELT METALS IN MIDAIR FOR HIGH PURITY NEXT WEEK

Refining of certain high melting point metals is made difficult by the fact that they pick up impurities from the crucibles in which they are melted. Westinghouse solves this by not using a crucible. Metals are suspended in midair by an electromagnetic field and melted by induction heat.

AJAX Induction Melting Furnaces— A Modern Tool for Industry



This oil painting, 9 feet long in full color, by J. Gordon White, shows AJAX-SCOMET installation at Scovill Manufacturing Company, Waterbury, Connecticut

Here is a new tool for melting metal. . . . Something that can concentrate enormous power in a small space. . . . Something that can be adapted to accurate pouring, to precise temperature control, to inert gas protection, to high-grade refractories. . . . A tool that can be used for all existing non-ferrous metals and alloys.

AJAX furnaces paved the way for continuous casting processes which lay dormant in old patents of farsighted inventors who thought ahead of their times. Junghans, with the help of the AJAX furnace, developed his continuous casting process at the Wieland Works in Germany before the last World War.

Scovill perfected the Junghans process in this country and is using AJAX-SCOMET furnaces of unprecedented sizes for melting, as shown in painting above. Nichols Wire & Aluminum Company used the first commercial Properzi machine for continuous production of aluminum wire from molten metal delivered by AJAX furnaces; U. S. Metals Refining Company is using AJAX-SCOMET furnaces for continuous casting of oxygen-free copper. Cleveland Graphite Bronze Company produce their famous stock for steel backed copper-lead bearings exclusively in AJAX melting furnaces. Hunter Douglas Corporation, Riverside, Cal., use AJAX furnaces for continuous casting of aluminum alloy strips for venetian blinds. AJAX furnaces are used in many plants and research laboratories for continuous bonding aluminum to steel.

AJAX made the first furnace for galvanizing steel in a refractory lining with accurate temperature control. AJAX furnaces were instrumental in the realization of modern squirrel-cage aluminum rotor production. AJAX supplied the first commercial automatic pouring device for die-casting machines.

These few examples show how AJAX induction furnaces can be applied to modern manufacturing methods. Write us for further information.

AJAX ENGINEERING CORP., TRENTON 7, N. J.

AJAX TAMA-WYATT INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax-Wyatt Induction Furnaces for Melting

The Iron Age
FOUNDED 1855

Whose Hook Is It?

THE Administration was at its wit's end early this week trying to force settlement of a strike it has nurtured from the beginning. It was reaping its own reward. And it was still bungling as usual.

We have the veiled (?) threat that if steel is not rolling soon the government will take over some steel plants to get defense steel. That method is a dubious one because it is hedged with legalities—something Harry Truman doesn't want to mess with anymore.

The idea that the Selective Service Act should be used to get steel for defense is silly. It was only a month ago that the steel firms and the union agreed to furnish all the defense steel necessary.

What happened to that solemn agreement? Certainly it is not the fault of the steel firms that defense steel is not rolling. They were and are willing to see that military steel is available.

There is not a steel firm in the country that is not willing to start up its plant or plants at great expense to fill military steel requirements. What then is holding up this production? It can only be one thing—the union is welshing on its agreement to make steel for the government.

Why then should Harry Truman take over steel firms again? There can only be one reason—to get the steel union off the hook. Or better yet to get Mr. Murray off the hook.

It is a matter of public record that the U. S. Steel Corp. has offered to start up any of its plants to make military steel regardless of cost —if the union will cooperate.

Other steel firms are willing to do the same in accord with their promise of many weeks ago. So far there has been no public explanation of why the union has not lived up to its patriotic offer to make military steel.

Could it be that Mr. Murray would have a hard time explaining to some steelworkers why others are working on government orders and they are not? Could it be that he wants to make the strike 100 pct effective so that he can force a union shop? Can it be that he fears many steelworkers are tired of striking for union shop alone?

There is one question that has been answered. The Administration has been and is trying to get Mr. Murray off the hook. But its efforts have been pitiful.

Tom Campbell

Editor

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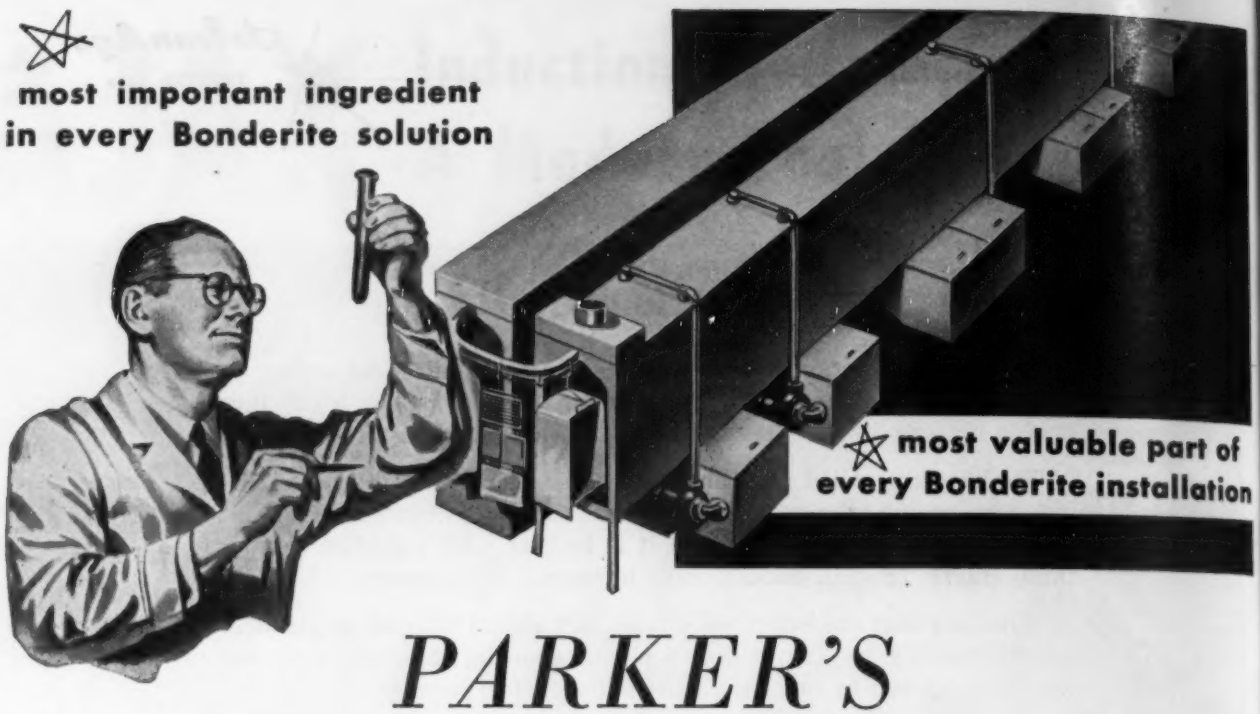

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Dear Editor:

Letters from readers

Tape-Controlled Tools

Sir:

Your report on tape-controlled tools in the May 29 issue has been read with interest.

We take exception to your claim that no equipment exists for economical production of job lots from 1 to 50. Also that it is too expensive to set up a turret lathe for only 16 pieces.

We have clear-cut evidence of the economical use of turret lathes on lots under 50 in tool rooms, repair shops and even production shops. We are in fact, surprised that any question should be raised about the use of turret lathes in this range since it is now largely a matter of tradition and history.

Production lots in the past several years have been higher on the average than in normal peacetime years. We must not forget, however, that the metal cutting industry will return to normalcy eventually and that the significance of the turret lathe in small and medium lot production will be resumed.

E. L. MURRAY
Sales Promotion Manager
Warner & Swasey Co.
Cleveland

Our write-up did not make it sufficiently clear that we were not making a claim. We were only reporting the opinion of some production men that tape-controlled tools will be more economical for small lots of nonrecurring parts. It is still debatable if experience justifies this opinion.—Ed.

Small Business for Steel

Sir:

It appears that some editors and writers are promulgating the idea that small manufacturers are pressing Steel to settle. I respectfully submit that small manufacturers who know anything at all are much more afraid of being ruined by settlement than by a refusal to settle on union terms.

(1) Every smaller manufacturer who is using or making iron and steel products knows that when the steel strike is settled he will be subjected to union demands equaling whatever settlements may be made by the Big Six.

(2) Small manufacturers know that they cannot obtain higher prices for their product because:

(a) The government won't permit higher ceilings.

(b) Customers are becoming scarcer and are demanding lower prices.

(3) With or without higher selling prices, smaller manufacturers see little hope of doing enough business continuously throughout the next twelve months to do more than cover the overhead if they succeed in that.

(4) Small manufacturers have been robbed of financial resources by outrageous taxes and their own inadequate tax base.

(5) The Big Six are the only factors of sufficient size and weight to protect the small manufacturers from the Murray-Truman combination.

The author of this letter is president of a relatively small midwestern manufacturing firm who prefers to remain anonymous.—Ed.

Fast Blades

Sir:

We refer to the Newsfront item in your July 3 issue on lawn mower blades being austempered in a salt bath in lots of 55 blades at a rate of 600 per hr.

Please advise where we may obtain additional data on this item.

S. J. GWOOSH
President
Excel Automatic Products, Inc.
Newark, N. J.

Full details will appear in our July 31 issue.—Ed.

New Spray Gun

Sir:

The last item on p. 69 of your July 3 issue describes a new spray gun which applies heat to the nozzle, saves paint and is said to produce thick coatings without danger of orange peel or cracking.

Will you furnish me with sufficient information to enable me to contact the supplier of this equipment.

O. M. OLIVIER
Chief Inspector
Pittsburgh Works
Allis-Chalmers Mfg. Co.
Pittsburgh

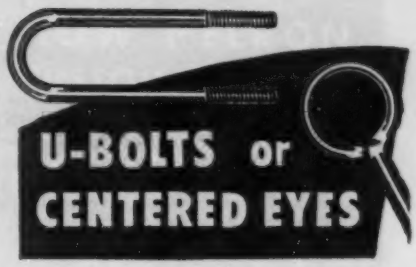
For more details write to the Capital Machinery Co., Danbury, Conn.—Ed.

17 Cr Stainless

Sir:

We would appreciate receiving five reprints of the article "17 Cr Stainless Replaces 18-8 in Many Weldments" by G. E. Linnert on p. 97 of your June 26 issue.

E. HERZFELD
David L. Wilkoff Co., Inc.
New York



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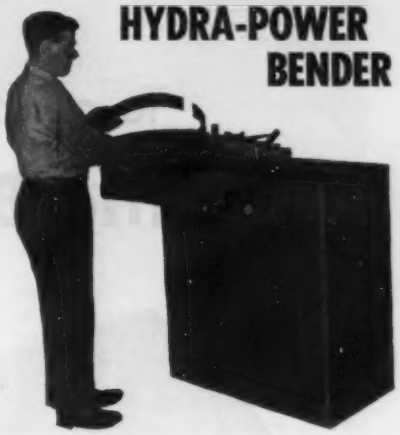

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Fatigue Cracks

by Charles T. Post

Advance Planning

First thing we did when we got home last night was to strip and climb in a cool tub. The temperature had been over 90 for five days running, with no end in sight. Settling back into the soothing waters, we picked up the paper to learn that the toy manufacturers had been having a big exhibition of their Christmas wares. Santa Claus was rampant on a shield of snow and icicles, so to speak, and we could imagine that somewhere in the background the adults were joining in a chorus of "Jingle Bells," with the host filling up the Tom and Jerries.

This is to let you know that the toy industry has nothing on the editors of your f.f.j. The editorial board already has approved the mockup and frozen the general design of the big Metal Show issue which will appear October 9. The big emphasis will be on "Metals of Tomorrow," which, it turns out, are a group of elements which have burst out of the obscurity of the periodic table to become important in their own right. These fugitives are cerium, germanium, lithium, selenium, and zirconium, with our old friends, molybdenum, silicon, titanium, and vanadium thrown in for good measure. The brains department says their treatment will be "definitive." This means that, as the Autumn leaves are falling, the subscribers will have an excuse for a long afternoon of reading instead of raking the lawn.

But that's not all. George Sullivan, the managing editor, has just dropped on our desk an eight-page prospectus for the 1953 Annual Review and Metal Industry Facts issue, which goes in the mails on New Year's Eve. Space is budgeted for 200 pages of editorial material. It almost makes us feel like breaking into "Auld Lang Syne." At least we feel cooler.

Yesterday's Car

Had a postcard today from F. H. Fish, Jr., of The Remington Arms Co., who apparently had just finished reading the issue of June 19. No one else noticed it, but we had said that a convertible 176 ft. long, which had inadvertently smashed its way into a Puzzler's problem, reminded us of a Dusenberg.

"No such car as the 'Dusenberg' ever existed," Mr. Fish gently chides. "Only the 'Duesenberg' ever has."

Duesenberg it may be. Actually, the car is little more than a symbol in our mind of something low, long, and snaky. But we do remember the Stutz Bearcat. Fellow in our town had a yellow one that, as it roared down the street, scattered the dogs and cats and attracted the girls like iron filings to a magnet. Most of these "dream cars" the auto builders are putting out these days for publicity are pale in comparison.

Convention

By the time this hits print, the Democrats will be in full swing in Chicago. Quite possibly the fate of the nation will be decided by whether they make better use of television than the Republicans did. We tried to follow the orations of the elder statesmen, but were diverted constantly by the characters wandering around in the background. One independent delegate even read a newspaper during the most important address of the whole show.

Without tipping the scales of political neutrality, we'd like to suggest that the Dems clear all delegates from the vicinity of the rostrum. Fill the space with Conover models with rapt expressions, legs discreetly crossed, of course. This might be considered an unfair diversion in some circles, but if the campaign is going to be decided by television, the politicians might as well take a tip from Godfrey.

Puzzlers

The diameter of the circle that would just fit the triangle was 5.1232 in. R. D. Hutchinson and R. T. Wakefield, Piper Engr. Co. used an airmail stamp to get their answers in just at press time.

A. W. MacLaren, U. S. Steel Co. used a planimeter to determine the area in the cow puzzler. P. C. Noy, E. Long, Ltd., is a little late with his answer to the bar problem.

Here is another cow puzzler suggested by C. E. Norton, Chicago. A circular fence encloses an area 200 ft in diameter. A cow is tied to the outside of the fence by a 200 ft. rope. What is the cow's grazing area?

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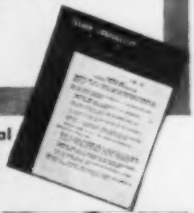

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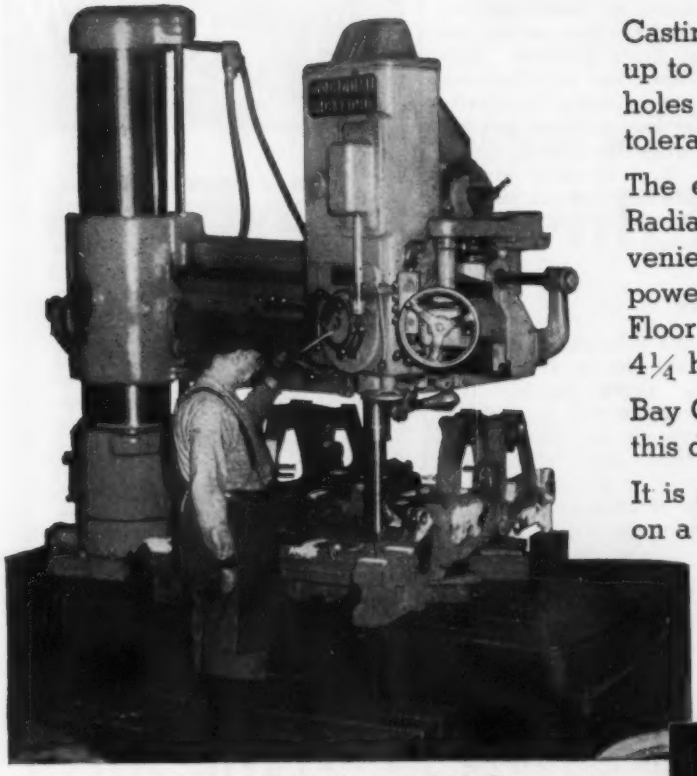


This 7' Super-Service Radial is one of 10 Cincinnati Bickford drilling machines at Bay City Shovels, Inc.

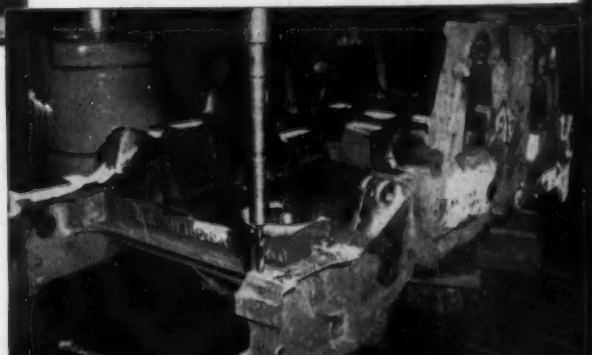
Castings 4' wide by 10' long, and weighing up to 3800 lbs., are handled on this job—65 holes are drilled on one set-up, with .003" tolerances.

The ease of handling of this Super-Service Radial, its accuracy, power and operator convenience have increased production on these power crane and shovel revolving bases. Floor to floor time cut from 6½ hours to 4¼ hours.

Bay City Shovels, Inc., states the upkeep on this drill has been low.

It is another example of a fine tool working on a fine product.

Write for Bulletin R-29, or consult our Engineering Department. Your drilling problems are our problems.



41/64", 1/4" and 1-61/64" diameter holes are being drilled in this illustration

A Bay City one-half cubic yard power shovel. Photos courtesy of Bay City Shovels, Inc.

RADIAL AND UPRIGHT SUPER SERVICE DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO. Cincinnati 9, Ohio U.S.A.

STEEL: New Supply Rush to All Sources

Where will consumer get his steel after strike? . . . Mills must first take military, AEC orders . . . Warehouses bled white . . . Chances of conversion steel less—By W. V. Packard.

How will the steel consumer fare after the strike?

It depends on the type and size of company, what it makes, past supply relationships, and, very much, on the ingenuity and energy of its purchasing agent.

But indications are that dragging in the steel will be very tough sledding at least until the second quarter of next year.

This is old hat to the veteran PA. Everytime he starts getting his inventory lined up and balanced to the point where he's sitting pretty — Boom! Something knocks the inventory props right from under him. This time it happens to be the longest and costliest steel strike in history.

His dream of steel plenty and balanced inventories shattered, the steel buyer is facing up to one of his sternest challenges yet—procurement in a controlled but badly disorganized market. If he's worth his salt he's already trying to figure how he might get extra steel for his company, without paying through the nose or sacrificing quality.

His sources of potential supply are (1) mills, (2) warehouses, (3) conversion, (4) foreign steel, and (5) gray market. None look promising.

Mills—Loss of close to 17 million tons of steel output has put steel companies so far behind they won't begin to see daylight for at least several months. The Controlled Materials Plan is badly snarled. CMP tickets will probably be honored eventually, but it will be some time before they can furnish much assurance of supply.

Meanwhile military and atomic energy customers will get first crack at all steel produced. Their take will zoom. In addition to their regular scheduled allotments, they will be rebuilding and rebalancing depleted inventories.

Before the strike the government said the military cut of steel output was about 20 pct, though military designations received by mills were reported running about 10 pct. The difference is caused by broader inclusions in government totals of military use.

Whichever figures you use, they are headed for a big spurt, possibly 100 pct, right after the strike. One steelmaker thinks nearly all of his first month's post-strike output will be for military use. After the initial spurt the military take will slowly settle back close to its pre-strike level.

A great deal of this military priority will be felt in the form of special overriding directives. They arrive in the mail suddenly and must be filled at once, taking precedence over all other scheduled orders. Mills will comply with the directives, but they don't like them. They force continual revision of production schedules and delay other orders accepted in good faith, thus straining customer relations.

How You Can Get Steel

Warehouses—How much steel warehouses can supply will depend largely on how much they get from the mills. Before

the strike they had finally been able to get their inventories up to about 50 pct of what they called normal. On some of the easier products they were actually shying away from the market while procurement of other items brought more inventory balance.

Now the warehouse cupboard is nearly bare. Eight weeks of strike have bled their inventories to anemic proportions. Before the strike warehouses were getting a little over 19 pct, or about one-fifth, of mill shipments.

This is an important part of steel distribution because warehouses service small plants that order less than mill quantities. And they are a quick source for small quantities that help bigger firms complete orders without waiting for additional mill shipments. Because of these important functions the warehouse share of steel isn't likely to be reduced. Even so, a warehouse's service can be no better than its inventory.

Combined shipments of steel to warehouses and military consumers might temporarily be close to half the mills' output right after the strike's end.

Conversion — There's little you can tell the purchasing agent about the conversion deal He invented it. Now he's dusting it off to see if its magic of turning ingots into sheets, bars and tubes still holds. But conditions are much different than they were when he put his conversion genie into mothballs about a year ago.

Biggest conversion customers used to be auto firms, though appliance, farm implement and other manufacturers came in for a share, too. Now the biggest conversion users are oil country people. In view of the pressure on them, they are going to be hard to pry loose from any of their sources—even if it is expensive steel.

The steel expansion program is another factor in conversion. Some mills that used to sell a lot of ingots have new rolling facilities coming into production. They'll roll their own. Others who formerly had excess rolling capacity are expanding basic steelmaking facilities.

The trend toward integration is plugging a lot of gaps that conversion used to fill. In these days of profit squeezing, cost of $150 a ton and up is bound to be a limiting factor.

Sources close to the conversion market believe it will be very tight for at least 6 months. Once the military peak has been met, some electric furnace people now making alloy steel might want to turn to production of carbon ingots for conversion (as they did before). But, by that time, the bloom is is likely to be off conversion.

Foreign Steel—The number of foreign steel offers and inquiries far exceeds the amount of steel that is actually imported. Desperate consumers are checking on it. And firms in other countries want to sell here to earn dollars. But there are many drawbacks.

First of all foreign steel is priced up to 50 pct or more higher than domestic mill steel. Care must be taken that required specifications can be met. Quality is not always up to American standards. American firms that have had most success using foreign steel in the past have sent their own metallurgists abroad to check it, or have made other arrangements to assure delivery of desired quality and specifications.

"Remember him? . . . Used to be with the Copper Div."

Delivery dates ranging to 3 months or more are also an impediment to steel imports.

Despite these handicaps foreign steel keeps trickling in at various U. S. ports, Eastern, Gulf, and West Coast. This can prove helpful to the purchasing agent who makes sure he knows what he is getting. But it will not become a big factor in the American market.

Gray Market—The amount of business conducted in the gray market never did match its publicity—even in the 1947-48 heydays. Tight control over distribution, plus mill policing, offer it little chance now. Curbstone brokers can get a little from foreign sources, but the fabulous markups of yesterday are now illegal. Few manufacturers could get permission to pass on the extra cost anyway.

This adds up to a very dim view of steel supply after the strike. The alert and resourceful purchasing agent can help his firm fare better than the average.

Continued operation of some firms in the eighth week of the strike is a tribute to the wisdom (or luck) of some PA's who kept buying while others liquidated. Even though they were told that steel was "better than money in the bank" some companies couldn't stock more than they did because of the cost. Fear of citation for inventory violation also held some in check.

The steel expansion program will be an enormous factor in recovery after the strike. It has been pointed out that the entire expansion gain has been more than wiped out by strike losses. True. But it can be pointed out with equal truth that the added capacity will help recoup the loss that much faster — provided it isn't kept idle for lack of iron ore.

STEEL: Brass Spells Out Stand

Industry executives appear before USW International Wage Policy Committee to explain management's position . . . Well received, but with no visible effect—By J. B. Delaney.

The steel strike hit a dramatic peak in Pittsburgh Monday afternoon when shirt-sleeved representatives of the steel industry explained the industry's position to leaders of the striking United Steel Workers of America.

It was a good show. The industry men came at the invitation of the union's 175-member International Wage Policy Committee. They almost missed the boat. When they arrived the meeting had officially ended, and some union people had gone home. Most were still milling around, though, and the meeting was resumed to hear the steel executives.

No Change—When the meeting was over, nothing was changed. The strike went on. But the industry representatives proved one thing—they believed enough in their position to explain it personally to a potentially hostile audience. As it turned out, they got a good reception.

Speakers were John A. Stephens, industrial relations vice-president of U. S. Steel Corp.; Joseph Larkin, vice-president of Bethlehem Steel Corp., and Admiral Ben Moreell, chairman of Jones & Laughlin Steel Corp. John Morse, general counsel for Bethlehem, also was present.

Turned Down—After a session of about 90 minutes, Philip Murray, union president, called for another vote on whether the union leaders wanted to accept the industry's final offer for settlement of the strike. Result was a resounding "no." Policy committee earlier had voted support of Mr. Murray in his refusal to settle on the basis of the industry's latest proposal. Meeting followed an unsuccessful union-industry attempt on Sunday to settle the strike.

Industry proposal, as read by Mr. Stephens, included a 12½¢ per hr general wage increase, retroactive to Mar. 16, an increase of ½¢ in the spread between job classes, six paid holidays, double time for holidays worked, increase shift differentials to 6¢ per hr on afternoon shifts, 9¢ per hr for night shift, 3 weeks vacation after 15 years service, decrease of southern differentials of U. S. Steel and Republic by 5¢ per hr. Agreement would run to June 30, 1954, reopenable June 30, 1953 on wages only.

As Mr. Larkin put it to the meeting: "This confirms what I've been telling Phil (Murray) for a couple of weeks—he's won a hell of a victory."

But it is on the union shop issue that the industry and the union do not see eye-to-eye. This continues to be the chief stumbling block to a settlement of the strike. The dramatic meeting appeared to have accomplished nothing in that direction.

Offered—This is the industry's offer on the union shop:

New employees sign an application for membership in the union. Between the 15th and 30th day of employment the new worker may resign from the union by advising the company by letter. The union then is notified of the worker's action. If he does nothing before the 30 days is up, he is in the union.

Another point is the industry's insistence upon retention of a 15-day escape period at the end of each contract. This would be in addition to the 15-day period in which new employees could resign union membership. It would permit old and new union members to leave the union.

Return to WSB—Before appearance of the industry representatives, the wage policy group voted to return to the full recommendations of the Wage Stabilization Board as a basis for settlement. If carried out this would mean that progress to date on the union shop would be nullified. Mr. Murray also emphasized that final settlement of the steel strike is contingent upon settlement of the dispute in the iron ore fields.

Mr. Murray earlier in the dispute had invited Ben Fairless, president and chairman of U. S. Steel Corp. and Clifford Hood, executive vice-president of U. S. Steel Co., to address union meetings. Both invitations were declined.

PR Victory—Mr. Murray was as surprised as anybody that the industry spokesmen showed up. In fact their appearance was preceded by a behind-the-scenes battle between industry industrial relations people and public relations people. The PR group won. That's what caused the delay.

USW LEADERS: Just leaving the conference room are (left to right) USW vice-president James Thimmes, president Philip Murray and secretary-treasurer David McDonald.

AIR LINE: Fingers in Many Pies

Transocean Air Lines to make Douglas wing sections in new plant . . . Driving force behind young firm with 15 subsidiaries is Orvis Nelson . . . War idea grows up fast—*By T. M. Rohan*

ORVIS NELSON

The sky's the limit with Transocean Air Lines. It was hatched as an idea in the "what-I'd-like-to-do-after-the war" conversation of war pilots on Okinawa, took off as a one-plane business shortly after the war, and was propelled to the point where it has 15 subsidiaries under its wing today.

Latest fledgling of the prolific parent is Western Sky Industries of Hayward, Calif. Under an $8 million contract it will assemble center wing sections for the Douglas AD-4, 5, and 6. First shipment of sections for the piston-powered carrier plane that has been used for ground support in Korea is scheduled for Sept. 1.

Transocean's Pilot—Man in the cockpit for Transocean is hard-driving, rugged Orvis Nelson, 45-year-old president. Plans made by soldiers for whipping up a civilian business after the war are usually pipe dreams that quickly dissipate. But Nelson impressed the dozen other pilots on Okinawa with the fact that he doesn't talk idly. In 1946 when United Air Lines decided to subcontract flights, Nelson and his war buddies scraped up $200,000 to buy a plane and shoulder their way into air transportation.

Transocean and subsidiaries today have 95 planes and 3500 employees. Technically a non-certified carrier, the line has flown everything from European refugees to 95,000 lb of gold bullion from Japan to New York.

In the short postwar period Nelson tacked on subsidiaries to Trans ocean with the acumen of a seasoned financier. Before the war he had been a United Air Lines pilot. He proved that business was just as much his element as the sky trails. (Nelson still logs over 800 hours per year flying time.)

Golden Touch — Nelson's enterprises are privately financed. He has exercised a business versatility that has included in Transocean's subsidiary roster such firms as a broom factory, a Chrysler-Dodge agency on Okinawa, an airline restaurant, an airplane maintenance shop at Oakland Airport, a flight school for pilots and stewardesses, an engineering research group, a crop spraying service, several foreign airlines, a printing shop, and an export-import firm.

A prize plum is the new $1 million Western Sky Industries plant, adjoining Hayward Airport, just south of Oakland. Employment is now reaching 150 people as Western tunes up to full production. By the end of this year 600 workers will be on the payroll. Core of the staff, technicians and supervisors, came from the Transocean family.

Construction Flying — In 1947, for instance, Transocean decided to find ways to cut into trans-Pacific passenger ship traffic. It discovered U. S. construction companies were hiring hundreds of workers for Pacific bases, paying fare and wages while en route.

Transocean moved in with a persuasive sales talk: "Fly the men out there in a few days. They can start work sooner. Paying wages and expenses during unproductive traveling time can be largely eliminated." Transocean carried more than 25,000 men to Pacific jobs.

A news clipping from an employee tipped Transocean off to the fact that England wanted to ship 7000 English immigrants to Ontario, Canada. Transocean flew a salesman to London. Soon what was probably the first mass immigration movement by air in history was in progress—via Transocean.

About that broom factory mentioned before. It was owned by Nelson's father, a lumber-man. It was having hard times and to prevent its loss, Nelson "swept" it into Transocean holdings. Now it is prospering again.

PRODUCT: Carrier-based Douglas AD-4 Sky Raiders have seen heavy ground-support action in Korea. Center wing sections will soon be assembled by Western Sky Industries near San Francisco under an $8 million contract.

CRYOLITE: Greater Supply Vital

Aluminum industry must have it . . . Only deposit, in Greenland, expected to run out in 12 to 15 years . . . Government backing synthetic expansion program—By *R. L. Hatschek.*

Cryolite is as indispensable to aluminum making as limestone is to iron production. And it's in short supply. Cryolite, or sodium-aluminum-fluoride, is the only known substance in which alumina can be dissolved, permitting the electrolytic reduction to metallic aluminum.

With aluminum output now at an annual rate of 1 million tons and slated to hit a rate of 1.3 million tons by the end of the year, demand for cryolite is soaring. About 68,700 tons will be needed by the aluminum industry in 1952 and an additional 3300 tons will be required by insecticide, enamel, opaque glass and other industries.

Face Depletion—Mother Nature made it tougher by putting the only known commercially workable deposit at Ivigtut, Greenland. This has been mined for nearly 100 years and is expected to peter out in the next 12 to 15 years. But it is possible to make it synthetically by reacting hydrated alumina and sodium carbonate with fluoboric acid. The last is made from fluorspar.

Pennsylvania Salt Mfg. Co. has the exclusive North American sales rights for natural cryolite, mined by a Danish firm under concession of the Danish government. Reynolds Metals Co. and Aluminum Co. of America, the only domestic producers of synthetic cryolite, produce about 21,600 tons per year.

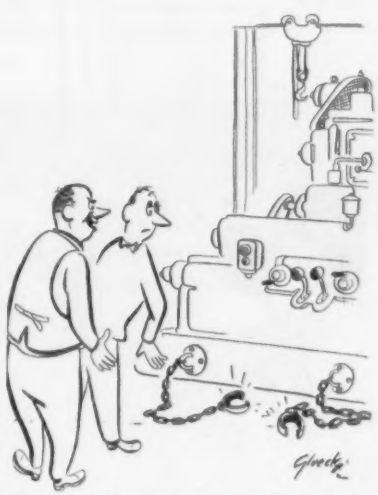
Potlines are generally started up on the natural product and are switched over to synthetic once they are operating. When running, the pots require the addition of only 0.06 lb of cryolite per lb of aluminum produced. This may be considerably reduced by substituting aluminum fluoride for some of the cryolite. Loss of cryolite is due to absorption by the carbon lining of the pots and vaporization.

Recover Half—Some recovery is possible even here. Kaiser Aluminum & Chemical Corp. claims it can get back half of its cryolite needs from scrapped linings in its new recovery plant at the Mead Works.

But the fact remains that cryolite is in extremely short supply despite various attempts at conservation.

Washington officials are well aware of this and have been taking steps to increase supplies of both the natural and synthetic material. Defense Production Administration has called for an expansion of synthetic production to 50,000 tons by 1955. Plans include all three present aluminum producers.

Under the only agreement so far in this expansion, Aluminum Ore Co., the Alcoa subsidiary producing cryolite, will boost its output by about 11,000 tons per year at the East St. Louis plant. The government will be supplied with 42,600 tons at a base price of 13.9¢ per lb for 91 pct cryolite. Deliveries will be 600 tons in 1952, 10,000 tons each in 1953 and 1954, and 11,000 tons each in 1955 and 1956.



"You'll find me pretty tough, but I'm fair, boy."

Prospects are that Kaiser will get a considerable quantity of this increased output, at least until that company can get into cryolite production. Anaconda-Harvey will also be cut in for some quantity. Any surplus would presumably be put into the national stockpile.

Natural Subsidized—Imports of natural cryolite will also be boosted during the next year. Defense Materials Procurement Agency is subsidizing Greenland mine output. Penn Salt will receive 31,000 long tons of ore in the 12-month period, 19,000 long tons more than the usual 12,000 tons.

Penn Salt will pay $100 per long ton for the extra ore rather than the customary $30. DMPA will then purchase the cryolite at $260 a short ton and resell it to aluminum producers at the current market price of $190 per short ton. This resale price is also the Office of Price Stabilization ceiling.

Acid grade fluorspar, one of the raw materials necessary to the production of aviation gasoline as well as synthetic cryolite, is also in for a supply boost. DMPA has contracted with St. Lawrence Fluorspar, Inc. for an additional 50,000 tons a year. The government will advance up to $1,250,000 for improvements and additions at the firm's Wilmington, Del., plant and Canadian property of its affiliate, the St. Lawrence Corp. of Newfoundland.

This contract runs for either 4 years or until 150,000 tons of concentrates have been produced by the additional facilities. An earlier DMPA agreement was made with the Ozark-Mahoning Co. of Tulsa, Okla., for a 20,000-ton-per-year fluorspar expansion.

RESIDUALS: No Storage Space Left

Strike-bound mills, steel-shy manufacturers not consuming . . . Refineries cutting back in the face of high demand for refined products . . . Situation reversed—By *E. C. Beaudet.*

The seasonal problem of keeping the nation's steel mills and industrial plants adequately supplied with industrial fuels during the winter months is not going to be a difficult one to solve this year. The steel strike, with its ever far reaching effects on all branches of industry, is starting to take its toll. Stocks of residual fuels are slowly mushrooming beyond the oil industry's capacity to store them.

Steel mills, one of the major consumers, have been unable to take up supplies as long as plants remain strike-bound. Manufacturers are steadily reducing their consumption as dwindling stocks of steel force them to shut down or cut back operations. Railroads, although not the heavy buyers they once were, are using less due to the transportation slow up.

Big Surplus—As a result, sales of industrial fuels have fallen off sharply in certain areas since the strike started. Greatest surpluses so far have appeared in the big steel producing and manufacturing areas of western Pennsylvania, West Virginia, Ohio, Illinois, Indiana and Michigan.

Petroleum Administration for Defense estimates between 150,000 and 200,000 barrels of residual fuel oil are not being consumed daily because of the strike. Refiners suffering most from this buying curtailment are those whose output of residuals is proportionately higher than that of others. In order to move the fuel, some prices are being cut and sales to Canada and other foreign countries are being sought.

Cutting Output—But, this does not seem to be enough. Refinery operations are starting to be curtailed in various sections of the country. In New York the daily run of crude has been cut from 25,000 to 17,000 barrels daily. In Philadelphia the crude run has been reduced about 10,000 barrels per day. One company has lowered crude runs in South America by 20,000 barrels while another in this country has reduced it by the same figure.

One small concern catering to the industrial field is reported to have stopped output at two of its refineries mostly because of the strike. All in all, PAD figures the crude run has been cut by 100,000 barrels per day so far. This figure is expected to increase as long as the strike continues. And no one is willing to hazard a guess on how long that crisis will continue.

What makes the situation difficult is that residual fuel production can't be shut off without stopping production of refined products, which are still in high demand, as well. Output of refined products versus residuals can be varied of course to cut down residual offtake. Up-to-date refineries can reduce residual offtake to 6 pct or lower.

"So who cares where she learned drafting?"

Strike the Climax—However, industry sources point out that surpluses of residuals were rising before the strike, particularly in the mid-continent areas of Oklahoma and Kansas, and that refiners have already cut residual offtake as much as their equipment would permit. Average offtake of residuals from crude oil runs about 20 pct nationally. Industry sources also claim that the increasing shortage of storage space for residual fuel oils has been building up for some time and that the steel strike brought it to a head.

The storage problem would have been much greater were it not for the strike in the refineries a short while back. With 40 pct of the refinery capacity cut off by the strike, the situation was the reverse of what it is now, with more residuals being consumed than produced.

Wildcat Well Supplies Protected

Sharp restrictions have been placed on acceptance and delivery of oil country casing and tubing in order to take care of exploratory drilling and defense needs.

For the duration of the strike, under a new order (Sched. 2, Dir. 1, M-6A) no such goods may be delivered or accepted unless the order carries the controlled materials symbols A, B, C, E and a digit, Z-2 or H2E.

This will make sure that wildcat drilling is carried on for a while, at least, according to National Production Authority officials.

But Defense Production Administration's goal of 25,000 new wells in the last half of 1952 has now been made impossible by the steel strike. In west Texas alone, 30 pct of the oil well drilling rigs are now down for lack of pipe.

The Canadian oil industry is also feeling the impact of the U. S. steel strike. New drilling there is almost halted by a shortage of pipe. (THE IRON AGE, July 17, 1952, p. 113.)

Jet Metalsmith Apprentices Train for New Era

New England, land of the craftsman, is fathering yet another artisan—the jet engine metalsmith. Within the sprawling East Hartford, Conn., plant of Pratt & Whitney Aircraft Co., a score of young men are learning intricate metalworking skills so necessary to building jet engines.

In July the number of apprentices will triple. Their course is equivalent to a college education for they are grounded in all phases of the jet plane in a 6000 hr course that runs 3 years.

Henry J. Mayer, chief apprentice instructor, says, "Piston engines mean friction but jets mean heat." The jet engine masses internal heat ranging from 1300° upwards. Because standard metals wilt in the jet powerplant, tougher, heat-resistant steel alloys must be worked. These "stiffer" steels put up a more stubborn stand against metalworking.

Apprentices get a course in metallurgy. Then comes shop training on hand tools, woodworking, plaster modeling, and on metalworking tools. Only a half day a week is spent in the classroom. Otherwise the boys are on the line—producing. They are shuttled from department to department to get a broad understanding of their new trade.

Apprentices earn while learning. They start at $1.15 per hr and get a raise after each 1000 hr of training. When they get their diploma they are earning journeyman's pay.

Old hands guide new ones in making a spot weld on this jet engine exhaust duct strut.

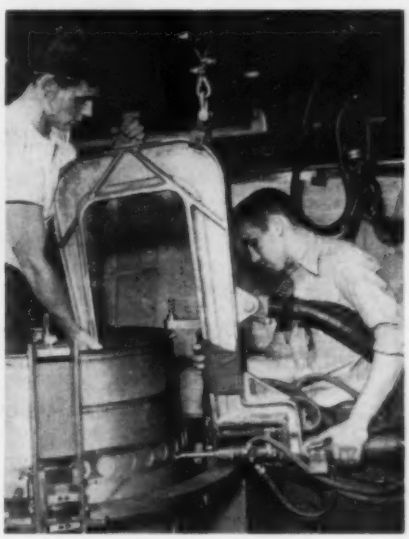
The old craft of spinning takes on new importance in modern jet engine production.

Permanent guidelines are scribed with trammel points after layout on the sheets.

Precision fixtures are used to form and keep intricate contours of afterburner sections.

Locations for holes in welded flanges are scribed by apprentice in advanced phase.

Trainees use precision gauges to check location of stiffening band on afterburner.



Two men are needed to handle the spot-welder tacking bands on the afterburner.

TINPLATE: Is Europe Catching Up?

Growth of foreign tinplate industry and planned expansions threaten U. S. export leadership . . . Steel strike hurts as it forces export quota cuts . . . Red dumping program anticipated.

America's traditional role as the world's leading tinplate exporter is getting some serious understudying. Increased European tinplate production and plans for further expansion are the first warnings that sharp declines in U. S. tinplate exports may not be far off. International markets that were once the private preserves of the U. S. may soon be thrown open to foreign competition.

Accentuating the American tinplate export plight is the domestic shortage caused by the steel strike (see THE IRON AGE, July 17, 1952, p. 86). No tinplate is being exported at present. As a result some of our best customers may start looking elsewhere soon.

Export Cuts—Even an end of the strike will not be an immediate cure-all for the export shortage problem. In order to catch up with domestic demands, export quotas will have to be cut. How much the cut will be is something to be determined when National Production Authority and steel industry advisers huddle in Washington.

There are rumors that some industry representatives favor complete elimination of tinplate exports. The chances of such a course being adopted are remote. Office of International Trade is reportedly anticipating a quota cut of around 25 to 30 pct. It is expected to be more.

End of the Line—Reasons for the resurgence of foreign capacity are increased steel production and more widespread use of electrolytic processing methods. As a result the trend towards complete U. S. domination of tinplate production may suddenly be slowed.

In 1929 American tinplate production represented 40.7 pct of the world's output. Ten years later the U. S. was responsible for 56.5 pct of total production. Last year the figure hit a lopsided 71 pct.

Our exports since 1938 have risen from 164,466 tons to around 499,081 in 1951. During the same period European imports of U. S. tinplate soared from 35,143 tons to 154,678.

War Push—World War II was a major factor in pushing U. S. tinplate development between 1939 and 1952. The sharp jump in tin demand resulting from the war forced wide use of electroplating. Europe was unable to adopt the method during the war years and it was not until 3 years ago that the process came into use abroad. With electrolytic tinplating being used more extensively and steel production on the rise, Europe has reason to be hopeful.

Foreign Expansion—In Poland steel output has gone up to nearly 4 million tons a year. Tinplate production has been boosted from 2770 tons in 1938 to 27,776 tons last year.

Czechoslovakia has made almost equally rapid strides. Its steel production, aided by German expansion programs during the war, has jumped from 1.1 million tons in 1938 to an anticipated 2.8 million tons this year. Tinplate output was only 4080 in 1938; reached the 35,000 ton mark last year and is going at a 60,000 ton a year clip so far.

Rumania and Hungary have also started tinplate expansion programs. Exact figures are not known, but estimates for each run between 6000 and 8000 tons.

Russia's production figures are closely guarded. Estimates by French, German and Italian manufacturers of electroplating machinery who ship and erect mills in Russia place the total somewhere between 285,000 and 320,000 tons; production in 1938 was 47,000 tons.

Reds Will Dump—European exporters expect Russia and its satellite to begin an extensive export program soon. Some predict it will reach dumping proportions. Already there are reports that Russian tinplate has appeared in Switzerland, Austria, Holland, Denmark, Trieste and Portugal.

European countries are confident they will have sufficient tin supplies. Russia is reported to have assured them at the Moscow Economic Conference that in the case of dwindling Bolivian or Malayan sources, South China will be able to sell whatever tin is needed. One Free World country recently purchased 772 tons of "Tangierian" tin. Tangier's tin production is 0.0

World Tinplate Production 1948-52

(Long Tons)

	1948	1949	1950	1951	1952 Jan.	1952 Feb.	1952 Mar.	1952 Apr.
Austria			90	71,000*				
Belgium	14,459	11,087	14,510	29,720	3,330	2,357	2,450	2,365
Czechoslovakia	8,900			35,000	5,000*	5,000*	5,000*	5,000*
France	69,653	93,431	132,000	131,000	12,000	12,000	12,000	13,000
Germany	111,200	166,300	201,639	239,836	20,049	20,093	19,690	16,310
Hungary	1,600			7,000*				
Italy	21,800	35,436	50,165	57,729	3,190	2,312	1,933	2,290
Norway	3,290	6,347	9,298	7,880	564	770	342	751
Poland				27,776				
Rumania				7,000*				
Saar-Territory	3,077	17,766	34,000	50,000	4,000	4,000	5,000	4,000
Spain	11,514	11,611	12,525	14,822	1,200*	1,200*	1,200*	1,200*
U.K.	610,100	620,100	662,800	636,600	68,300	57,900	60,000*	60,000*
U.S.A.	3,416,354	3,321,890	4,088,639	4,014,443	265,950	320,711	427,209	355,303
U.S.S.R.				300,000*				

* Estimated.

Controls

Aluminum Price Rise Predicted

Favorable consideration by the government of the aluminum industry's request for a price increase is predicted by producers.

Still to come is a discussion between Office of Price Stabilization officials and a committee representing producers and independent fabricators, who will consider ways in which a price rise might be worked out.

An application from Aluminum Co. of America prompted OPS to plan the industry-government talks. Asked by Alcoa was a rise of 2¢ per lb on aluminum pig and a 10 pct increase in the price of ingot and semi-fabricated and fabricated aluminum items.

The company pointed out that costs of raw materials, freight, power, and labor have risen sharply, while higher labor costs can be predicted. This view was supported in an application by Kaiser Aluminum.

Price increases will be considered as an industry-wide matter. If granted, says OPS, an eventual result will be higher costs to the consumer for finished aluminum items and a number of durable goods containing the metal.

Industry Controls This Week

Auto Wreckers—Amend. M-20 removes auto wreckers from the group who must file records and reports under the provisions of the regulation.

Class B—Interp. 1, CMP Reg. 1 defines more clearly the Class B producer classification.

Coal—Amend. 3, SR 4, GCPR grants a ceiling increase to tidewater coal dock dealers.

Copper — Revoc. M-97 lifts limitations on use of copper and its alloys.

Oil Tubing—Sched. 2, Dir. 1, M-6A places restrictions on delivery of oil country casing and tubing.

Petroleum—SR 11, CPR 17 establishes ceiling prices on automotive gasolines, kerosene, diesel fuels, furnace and stove oil at 735 West Coast bulk plant points.

Steel—Amend. Dir. 12, CMP, Reg. 1 authorizes producers of civilian goods to draw particular types of steel from warehouses.

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B BETTER PRODUCTS
C AT LOWER COST

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SQUARE-RECTANGULAR
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Carbon 1010 to 1025

Michigan Tubing
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Fabrication by Michigan of this volume part, which has a diameter variation of 51 per cent, is only one example of the workability of Michigan tubing and of Michigan engineering competence.

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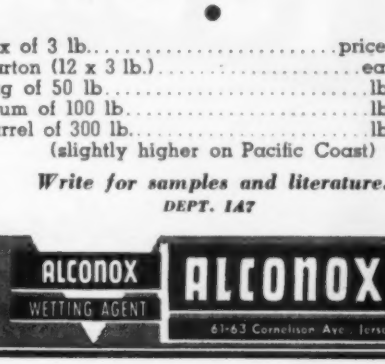

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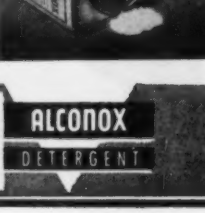

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—Controls—

Ore Mine Operating Data Asked

Mine operating data from independent iron ore producers in the Lake Superior district will be needed to assist Office of Price Stabilization in considering an industry request that ore mined in the area be removed from price control.

Officials of the agency told producers' representatives they would like to review such data "as quickly as possible."

Under present price ceilings, industry spokesmen said, small independent producers engaged in marginal operations cannot negotiate with steel companies for higher ore prices. They argued that current OPS standards for price increases, including the earnings standard, are not suitable for their use because of the necessity for earmarking funds for exploration, drilling, and developing reserves.

Spokesmen called attention to a recent Defense Materials Procurement Agency report stressing the need to suspend or adjust price ceilings on merchant iron ores from the Lake Superior region to prevent loss of production and subsequent losses to defense.

Current production capacity in the area is slightly more than 100 million gross tons per year. Only 24 pct of this production is sold on the open market, industry representatives told OPS.

Consumer Quota Shifts Okayed

For the first time since start of CMP, manufacturers of consumer durables are to be permitted to shift their materials allotments among their own products in any way they like.

Effective with the third quarter there will be a single listing in place of the two groups under which products were listed in M-47B's existing schedule.

Allotments may be shifted among these products in any way the maker pleases. Previously, interchange was permitted only between items within specific groups.

Reason for the relaxation is the increasing supply of copper and aluminum.

Latest Government Appointments

John M. Bulkley, director, Industrial Materials and Manufactured Goods Div., OPS;

Vice Admiral Edward L. Cochrane, member, Federal Maritime Board;

F. W. Fitzpatrick, assistant deputy administrator, Program and Requirements, DPA;

M. B. McCafferty, director, Iron and Steel Div., NPA;

Robert L. McMurtrie, chief, Lignite Branch, Region V Fuels Technology Div., and superintendent, Charles R. Robertson Lignite Research Laboratory, Bureau of Mines, Dept. of Interior;

John M. Mohler, director, Construction Machinery Div., Industrial and Agricultural Equipment Bureau, Dept. of Commerce;

Albert G. Natwick, director, Pulp, Paper and Paperboard Div., NPA;

L. A. Schlueter, assistant director, Chemicals Div., NPA;

Lester A. Shea, chief, Industrial Heating Equipment Section, Metalworking Equipment Div., NPA;

Collis Stocking, director, Production Div., DPA;

L. Gordon Walker, director, Construction Div., DPA;

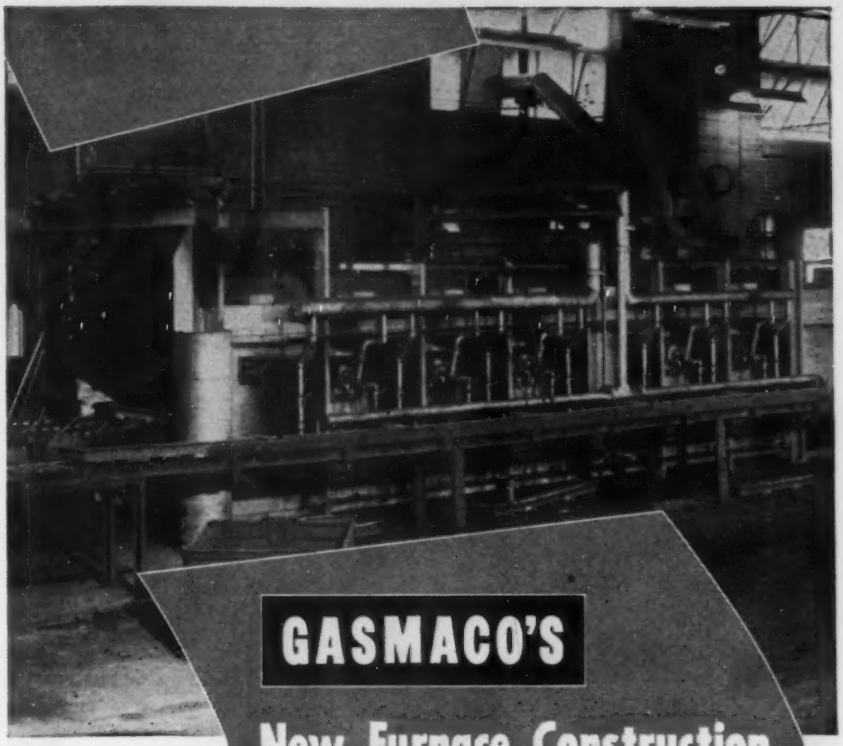
James A. Williams, assistant to deputy administrator, Program and Requirements, DPA.

Prices May Be Based on Invoices

Resellers of machinery and similar manufactured goods may determine ceiling prices, beginning July 26, on the basis of most recent net invoice or delivered costs, plus the applicable markup provided in Section 4, Ceiling Price Reg. 67.

Previously, resellers were required to apply to Office of Price Stabilization for a method of computing price ceilings.

Amend. 10, which alters this requirement, also makes it clear that in determining commodity cost, the net invoice or delivered cost is that of an item priced when bought from a normal source of supply. For example, in the case of a retail reseller of machinery the normal or customary supply source would be either a wholesaler, a distributor, or a jobber.



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STORAGE BATTERIES

—Financial—

Investment:

Almost $500 million for expansion invested in metals firms in 1951.

Metal producers raised nearly $500 million for expansion from private sources in 1951, according to *The 1951 Yearbook of Private Placement Financing,* published by E. V. Hale & Co., Chicago. If the $100 million Labrador iron ore development is included, the total is near $600 million.

Proceeds of the $100 million issue of first and collateral trust mortgage 3.75 pct 26-year bonds were not taken down during the year. But commitments were obtained from a group believed to include 18 or more institutional investors by five intermediaries acting for the newly formed Iron Ore Co. of Canada. Backed by junior obligations to be taken by major steel producers, funds will be used to develop Labrador iron ore.

Loans—Fourteen steel firms got loans or commitments totaling $270,250,000 during the year, according to the Hale Yearbook. Loans of three related enterprises added $31 million to make the iron and steel total, exclusive of iron ore, $301,250,000. Republic Steel Corp. was the largest borrower, with an issue of $60 million convertible debentures, due 1966, taken by two life insurance companies. These were supplemented by $40 million 3 pct 15-year notes taken by General Motors Corp. to be repaid in steel deliveries.

Colorado Fuel and Iron Corp. was the second largest borrower in the steel group, with issues of $30 million first mortgage and collateral trust 4.25 pct 20-year bonds and $10 million 3.75 pct 5-year notes. The former was taken by a group of long-term institutional investors, and the latter by four banks.

Four loans of $25 million were placed for others in the steel group, and one for a company in a related line. Steel companies were Armco Steel Corp., Youngstown Sheet & Tube Co., Pittsburgh Steel Co., and Granite City Steel Co. A. O. Smith Corp. was the other borrower.

Freight:

New railroad gondola car unloader tested with coal, sand screenings.

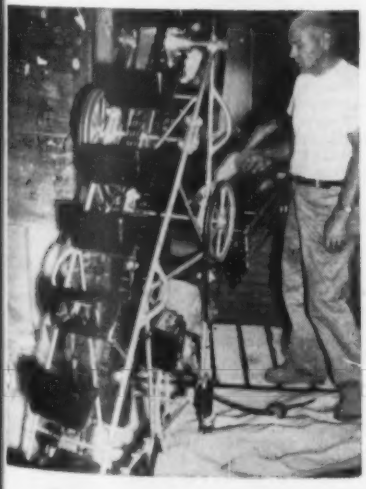
A good-looking bet for unloading granular materials was the Rajon car unloader demonstrated at Chicago last week. Unloading sand and coal screenings, the light 650 lb machine scooped out the contents of a 50-ton gondola in a little over 2 hr.

Still waiting demonstration, and scheduled for showing to the public this week, was a freight car unloading version of the original machine.

The two belt-and-bucket type machines are powered by 1 hp electric motors that will operate at 220 to 240 v. Illinois Central R.R. yardmen used the gondola unloader in moving a carload of fine engine sand, then switched it over to a carload of coal screenings.

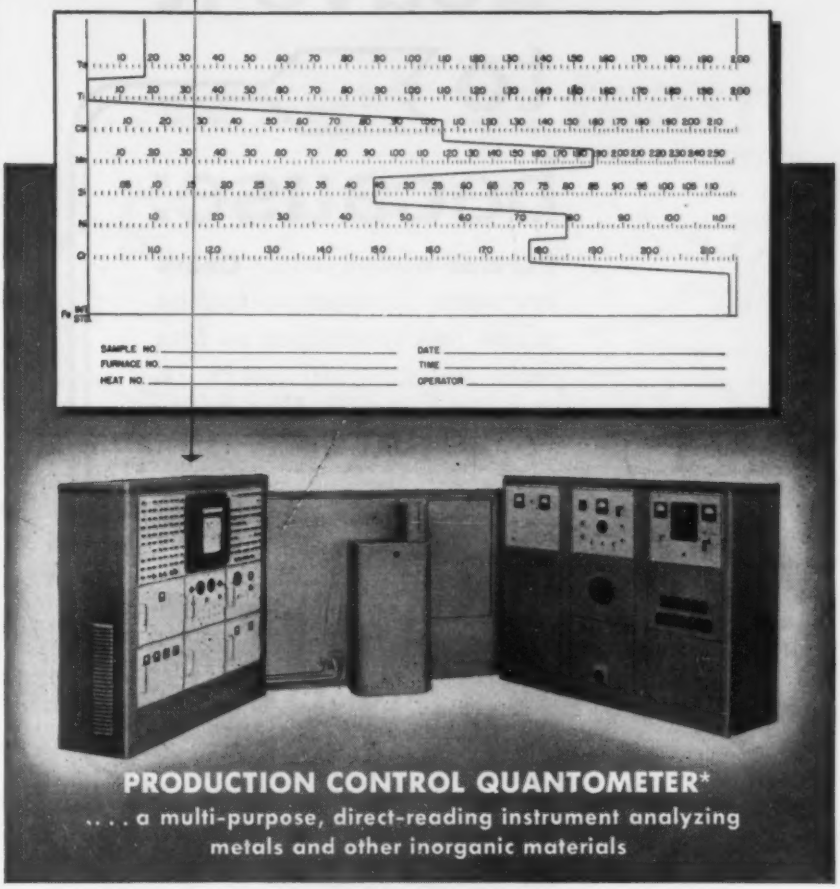
Limitations—On finely divided materials the unloaders worked well. They had already been put into test operation by two West Coast railroads. Railroad men who studied the operation were doubtful about their ability to move larger materials, such as engine coal with a lump diameter that might run from 2 to 6 in.

Illinois Central was warm regarding the Rajon's work on fine materials, however. An IC railroader estimated that the machine he had seen in action could unload a car in 5 or 6 hr that would require four men and 2 days of time if unloaded manually.



THE INSIDE STORY ON STAINLESS STEEL

Shown below is a multiple-copy graphic record of a typical stainless steel chemical analysis made on an ARL Production Control Quantometer.* Accurate percentages of elements present in the alloy are recorded permanently in pen-and-ink in less than two minutes! And steel is only one of many metals and inorganic compounds which the unique ARL Quantometers are controlling daily as to routine chemical analysis in many types of industries.



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Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Lathe, engine, heavy-duty and accessories, $35,219, W. E. Shipley Machinery Co., Phila.

Components for kit, conversion, fire, $68,683, Bowser, Inc., Wayne, Ind.

27 itms of spare parts for flamethrower, $123,133, Lecourtenay Co., Newark.

Connection boxes, 391, $66,693, Hartford Metal Prod., Inc., Arberdeen, Md.

Lights, non-magnetic, 600, $26,350, Lightoller, Inc., New York

Power distribution panels, 25 sts, $40,523, Ets-Hokin Galvin, Wilmington, Cal.

Switch box, 756, $47,477, U. S. Instrument Corp., Summit, N. J.

Feeder, distribution box, 480, $64,056, Palmer Elec. & Mfg. Co., Wakefield, Mass.

Switch, multiple, rotary, 1200, $61,839, S. H. Couch Co., Inc., Quincy, Mass.

Box, terminal, 300, $30,981, Palmer Elec. & Mfg. Co., Wakefield, Mass.

Switch, multiple, rotary type, 1050, $29,610, S. H. Couch Co., Inc., Quincy, Mass.

Valves, temperature regulating, 1130 ea, $78,167, Robertshaw-Fulton Controls Co., Knoxville.

Valves, cylinder oxygen, 52304 ea, $88,341, Superior Valve & Fitting Co., Pittsburgh.

Valves, gate, 14,800 ea, $38,138, Hammond Brass Wks, Hammond, Ind.

Lockers, clothes, stl., 10,093 ea, $339,360, Andrew Wilson Co., Lawrence, Mass.

Coffee maker, electric, 3060 ea, $126,500, The Silex Co., Washington.

Holders, card corrosion resisting steel frame, 67,000 ea, $98,624, Society for Visual Education, Inc., Chicago.

Float, firing, jack assy, 350 ea, $25,060, Rockingham Machine Co., Davenport, Ia.

Solenoid and relay, 600 ea, $31,620, The Magnavox Co., Fort Wayne, Ind.

Elevating screw and housing assy, 1260 ea, $36,477, Warren Foundry & Machine Co., South Gate, Cal.

Grinder, electric, 195 ea, $60,537, Wyzenbeck & Staff, Chicago.

Light, blackout, 4000 ea, $80,520, A. L. Smith Iron Co., Chelsea, Mass.

Wrench, electric, 555 ea, $358,822, Independent Pneumatic Tool Co., Aurora, Ill.

Wrench, pneumatic, 1300 ea, $358,829, Independent Pneumatic Tool Co., Aurora, Ill.

Var itms of drills, 200 sts, $97,731, Avildsen Tools & Machines, Inc., Chicago.

Ice making machine, 19, $54,418, Ajax Corp. of America, Evansville, Ind.

Dimmer, Lamp, 27,220, $33,616, Hellmich Mfg. Co., St. Louis, Mo.

Reflector, lamp, aluminum, 131,300, $48,370, S & M Lamp Co., Los Angeles.

Dimmer, lamp, 49,891, $63,860, Kurt Versen Co., Englewood, N. J.

Wattmeter modification kit, 448, $53,929, Pelham Electric Mfg. Corp., Erie, Pa.

Spare parts, job, 25,714, The Electric Auto-lite Co., Toledo.

Spare parts, job, 43,303, Wallace & Tiernan Co., Newark.

Spare parts, job, $25,739, Electric Machinery Mfg. Co., Philadelphia.

Spare parts, job, $41,546, D. W. Onan & Sons, Minneapolis.

Spare parts, job, $50,407, Electric Machinery Mfg. Co., Minneapolis.

Spare parts, var, 44,761, Knorr Maynard, Inc., Detroit.

Spare parts, var, 54,609, B. F. Goodrich, Akron, Ohio.

Tractors, mowers, sweepers, 35 ea, $55,111, Minneapolis Moline Co., Minneapolis, *W. C. McFarlane, Jr.*

Truck, body, 85 ea, $28,584, McGable Powers Auto Body Co., St. Louis.

Clamshell bucket, 47 ea, $43,937, Pettibone-Muliken Corp., Chicago.

Dragline bucket, 34 ea, $17,716, Pettibone-Muliken Corp., Chicago.

Compressor, 36 ea, $43,970, Worthington Corp., Chicago.

Compressor, 116 ea, $64,656, Harris Supply Co., Chicago.

Compressor, 7 ea, 58,368, Le Roi Co., Milwaukee.

Vent, assy, 360, $62,190, R. H. Bouligny, Inc., Charlotte.

Leg, left, assy, 3900, $114,855, Food Machinery & Chemical Corp., Lakeland, Fla.

Leg, right, assy., 1580, $20,097, Food Machinery & Chemical Corp., Lakeland, Fla.

Replacement parts for star gages, 1 lot, $26,736, Niles-Bement-Pond Co., West Hartford, Conn.

Tool, ramming & extracting, 9500, $10,225, American Swiss Mfg. Co., Detroit.

Rammer, unloading, 2000, $43,800, Nolan Corp., Rome, N. Y.

Wrench, vent assy, 130, $51,610, Rollins Engine & Machine Co., Inc., Nashua, N. H.

Rod, feed, right, 1850, $148,925, J & L Supply & Equip Co., Inc., Fort Worth, Texas.

Rod, feed, left, 1400, $112,700, J & L Supply & Equip Co., Inc., Fort Worth, Texas.

Pawl, 7000, $25,970, J & L Supply & Equip Co., Inc., Fort Worth, Texas.

Pawl, 2500, $9,275, J & L Supply & Equip Co., Inc., Fort Worth, Texas.

155 MM gun T80, 88, $1,149,000, Hughes Gun Co., Houston.

Government Inviting Bids

Latest proposed Federal procurements, listed by item, quantity, invitation No. or proposal, and opening date. (Invitations for Bid numbers are followed by "B," requests for proposals or quotations by "Q.")

Corps of Engineers, San Francisco.

Pipe, stl, A.P.I., line, seamless, or lap welded, painted olive drab, 2500 ft, 04-203-53-26, July 24.

Corps of Engineers, Chicago.

Drifter, drill, pneu, 89 ea, B-3B, July 23.
Compressor, air, 32 ea, B-2B, July 23.
Tractor, wheel, 25 ea, A-4B, July 23.

Rock Island Arsenal, Rock Island, Ill.

Gage, 590 ea, 11-070-53-6B, Aug. 7.

Philadelphia Quartermaster Depot, Phila.

Insignia collar, 2464000 ea, 7B, Aug 8.

Bureau of Ships, Washington.

Check valve, 50, 548-593Q, Aug 8.
Drainage elbow F-1505, 75, 548-593Q, Aug 8.
Pressure reducing valves, 25, 548-6001Q, Aug 7.
Gate valves 2 in, 50, 548-6001Q, Aug 7.
Glove stop check & bronze globe needle valves, 896, 548-598Q, Aug 4.
Simplex and Duplex Strainers, 225, 541-7Q, Aug 7.
Ventilation Heaters, 1088, 5490377Q, July 28.
Convection Heaters, 491, 549-425Q, July 28.

General Service Administration, Dallas.

Machine, paper fastening, 540 ea, FW-22378, July 29.

General Services Administration, Washington.

Hospital furniture, misc. var, 1K-15171-2-R, July 30.
Bullgraders, hydraulic, 14 ea, MSA-93-740-00-309-244, Aug 8.
Winch set, 14 ea, MSA-93-740-00-309-2440, Aug 8.
Harrow plows, 14 ea, MSA-93-770-00-309-2441, Aug 15.
Subsoilers and ditchers, 14 ea, MSA-93-770-00-309-2441, Aug 15.
Tractors, 16 ea, MSA-93-831-00-309-2442, July 31.
Power sprayers, 5 ea, MSA-93-770-00-370-2458, Aug 1.

General Services Administration, San Francisco.

Axes, 72 ea, SF-18, July 28.
Braces, ratchet, GGG-B-671A, 144 ea, SF-18, July 28.
Files, hand-saw, 2116 ea, SF-18, July 28.
Hatchet, 196 ea, SF-18, July 28.
Hoe, grub, 30 ea, SF-18, July 28.
Knives, putty, 504 ea, SF-18, July 28.
Compass, 75 ea, SF-24, July 29.

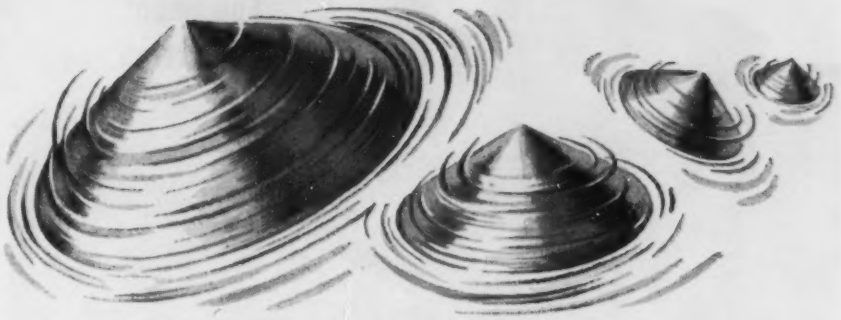
Watervliet Arsenal, Watervliet, N. Y.

Laminairies, 70 ea, 53-5B, July 30.

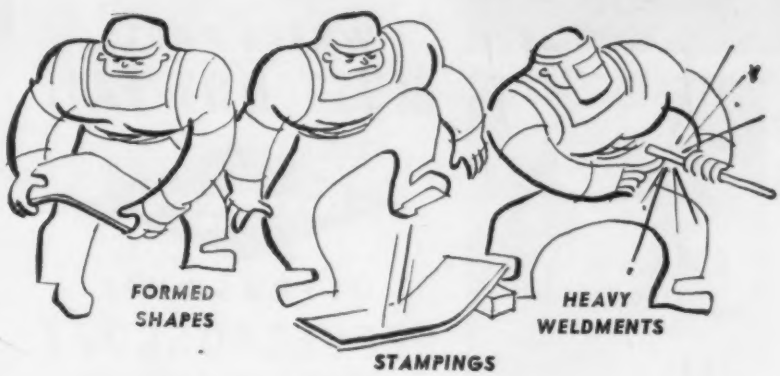
General Stores Supply Office, Phila.

Heaters, water, 80 ea, 1-1099B, July 30.

flying saucers...



...and Brandt's BIG THREE!



Brandt's big three—Stampings, Formed Shapes, and Heavy Weldments—are ready to mass produce parts for such seemingly fantastic projects as flying saucers, if and when such machines are ever built . . . just as they completed "Operation Mothball" for the Navy.

Whatever the metal-working job, government and private contractors who place their orders for precision metal work with Brandt are sure of accuracy, on-time deliveries and peak mass-production economy.

STAMPINGS • WELDMENTS
SPOT WELDED ASSEMBLIES • PRESSED STEEL SHAPES
in all types of metal

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BALTIMORE

CHARLES T. BRANDT, INC., BALTIMORE 30, MD.

FOR THE
AUTOMOTIVE and
Heavy Construction
Equipment
Industries

Two thousand transmission shafts per day are easily and dependably tested for hidden internal defects with a Sperry Reflectoscope.

WHERE PARTS
MUST NOT FAIL
THE Sperry
ULTRASONIC
REFLECTOSCOPE
PROVIDES FAST, DEPENDABLE
100% TESTING

A huge kingpin is tested for flaws through its entire length.

Reflectoscope testing this steering gear will reveal any hidden defects in the metal or in the weld where the two ends are joined.

AUTOMOTIVE INDUSTRY: A dangerous accident caused by the failure of an important part would seriously damage the reputation of an automobile manufacturer. For this reason, the Molloy Manufacturing Company of Detroit — producers of COLD FORGED steel transmission shafts for two major automobile corporations — rely on Sperry Reflectoscope testing to eliminate the possibility of hidden defects in their product.

HEAVY CONSTRUCTION EQUIPMENT: The "Tournarocker", manufactured by R. G. LeTourneau, Inc. of Peoria, is a powerful, high-speed, materials-handling machine that can carry *18 tons* fully loaded. Capable of traveling at 35 m.p.h., it is extensively used wherever huge amounts of material must be moved. As any parts failure on-the-job would, obviously, be dangerous and cause costly delays, the Le Tourneau Company looks to Sperry Reflectoscope testing to assure that nothing but defect-free axles, gears and kingpins are incorporated in the "Tournarocker".

Learn how you can reduce testing costs and improve quality control in your plant. Write today for complete information about the Sperry Reflectoscope . . . for sale, or for lease. *Ask about Sperry's day to day Testing Service.*

Sperry
SPERRY PRODUCTS INC.
307 SHELTER ROCK ROAD
Danbury, Connecticut
REPRESENTATIVES IN PRINCIPAL CITIES

—Construction—

Steel Inquiries and Awards

Fabricated steel awards this week include the following:

604 **Tons,** Belle Vernon, Pa., bridges for Pennsylvania State Highway & Bridge Authority, Frank Mashuda, Pittsburgh, low bidder.

550 **Tons,** Bethlehem, highway bridges, for Pennsylvania State Highway & Bridge Authority, to Bethlehem Steel Co., same city.

270 **Tons,** Philadelphia, Aramingo Ave. Bridge, Mack Paving & Construction Co., low bidder.

150 **Tons,** Nitro, W. Va., pulp storage building for American Viscose Corp. to Bethlehem Steel Co., Bethlehem.

Fabricated steel inquiries this week include the following:

2088 **Tons,** Lehigh County, Pa., two deck plate girder and I-beam bridges, divided highway LR 771, Sect. 5, Pennsylvania State Highway & Bridge Authority. Bids due Aug. 8.

2077 **Tons,** Boston and Chelsea, Mass., superstructure of Andrew F. McArdle bridge over Chelsea River, connecting Meridien St., East Boston and Pearl St., Chelsea. Completion date June 30, 1954.

873 **Tons,** Northampton County, Pa., divided highway, 3 deck plate girder bridges, 1 I-beam bridge, connecting ramps and service roads, LR 771, Sect. 4, Pennsylvania State Highway & Bridge Authority. Bids due Aug. 8.

175 **Tons,** Monroe County, Pa., divided highway, 1 I-beam bridge, service roads and ramps. Pennsylvania State Highway & Bridge Authority. Bids due Aug. 8.

Reinforcing bar inquiries this week include the following:

497 **Tons,** Northampton County, Pa., divided highway, 3 deck plate girder bridges, 1 I-beam bridge, connecting ramps and service roads. Pennsylvania Department of Highways, Harrisburg, Pa. Bids to Aug. 8.

404 **Tons,** Lehigh County, Pa., two deck plate girder and I-beam bridges, divided highway. Pennsylvania Department of Highways, Harrisburg, Pa. Bids to Aug. 8.

177 **Tons,** Monroe County, Pa., divided highway, 1 I-beam bridge, service roads and ramps. Pennsylvania Department of Highways, Harrisburg, Pa. Bids to Aug. 8.

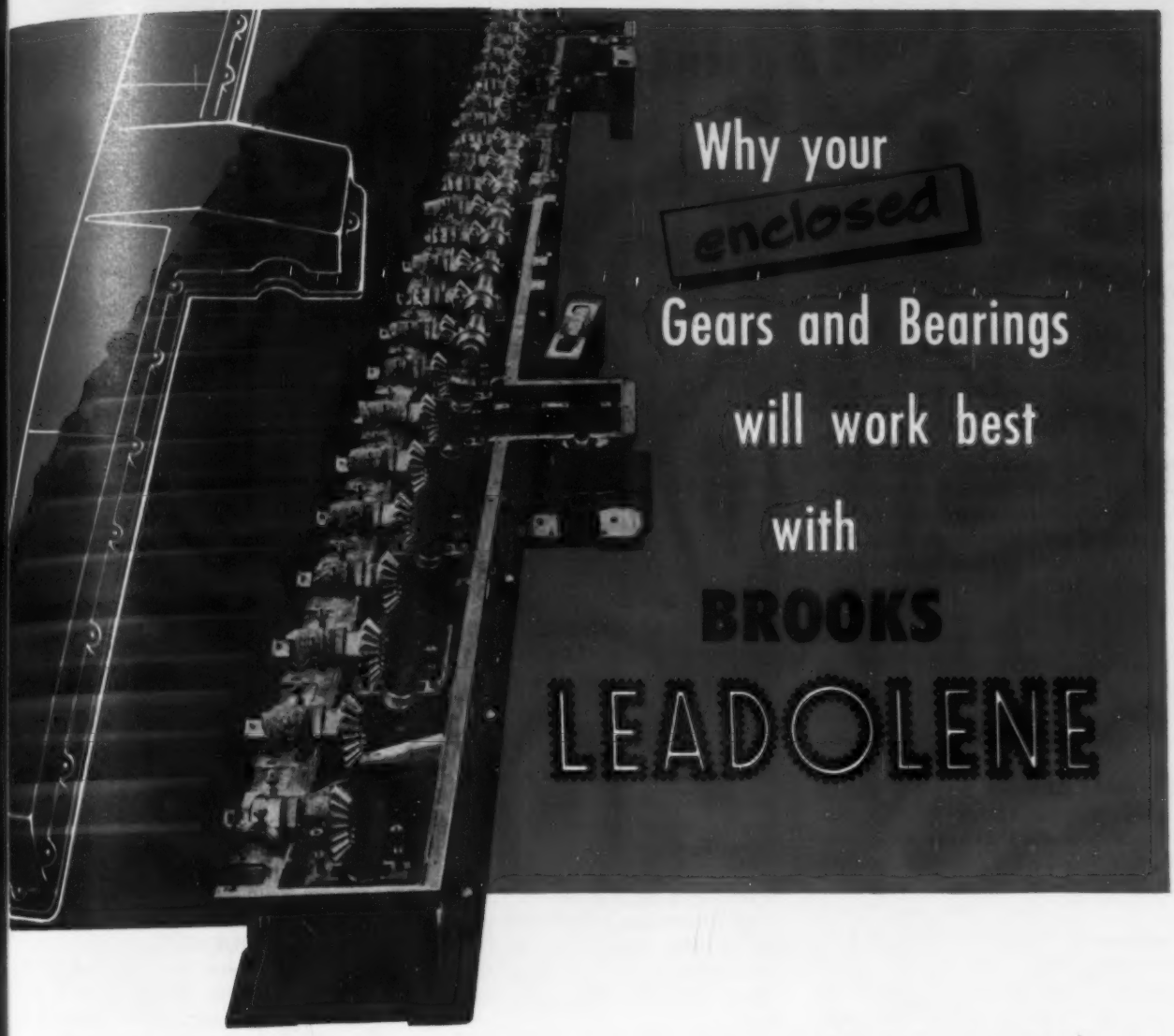
Building Credit Curb Easing Seen

Bureau of Labor Statistics reports that residential housing starts amounted to 106,000 during June to bring the total for the half-year to nearly 524,000 family units.

This means that the Federal Reserve Board shortly will have to lift any credit controls which require down payments of more than 5 pct.

The board order will likely be issued in September since the act calls for such action when the building rate on an annual basis falls below 1.2 million units.

While the June 1952 rate was slightly above the 1951 second quarter rate, the steel strike and cutting off of supplies makes it improbable that a quarterly rate of 300,000 can be maintained through July and August.



Enclosed gears . . . with their close tolerances, high speeds, shock loads, and great bearing and tooth loads . . . operate best when protected by Brooks LEADOLENE. With its "Indestructible pH-ilm Strength," this lead-based lubricant is definite assurance against pitting, galling, finning of teeth and abnormal bearing wear. The lubricating efficiency of LEADOLENE is not affected by water.

The following case history indicates the kind of service you can expect from LEADOLENE: "*Although a good quality lubricant was used in a certain Cleveland plant's enclosed gear reduction units . . . the gears, bearings and shaft journals required replacement so frequently that the reductions were taken apart every four months. At that time they were cleaned, some replacements were made and new lubricant was added. When LEADOLENE No. 90 was adopted as the lubricant, the reductions were operated for over two years with no replacements and no serious wear.*"

For reduction gear sets . . . mill table gear drives . . . or any other enclosed gear application—you will profit by standardizing on Brooks LEADOLENE as your lubricant.

WRITE for the 20-page brochure, "The Brooks Oil Story". . . or for consultation by a Brooks Engineer.

With LEADOLENE you get these characteristics

pH-ilm Strength . . . 30,000 psi minimum.

Adhesiveness . . . Affinity for metal develops maximum adhesion providing permanent coating on gears.

Water Repellence . . . Effectiveness is not reduced by water.

Corrosion Prevention . . . Never acidic and will not etch or corrode.

Compounded Stability . . . Will not bleed or change physical condition within a greater temperature range.

Low Temperature Factors . . . Does not harden, crack or decrease in adhesion.

Abrasive Resistance . . . Repellent to adhesion of scale, metallics and other contamination.

THE BROOKS OIL CO.
Since 1876

Executive Offices and Plant . . . . . **Cleveland, Ohio**
Executive Sales Offices . . . . . **Pittsburgh, Pa.**
Canadian Offices and Plant . . . . . **Hamilton, Ontario**
Cuban Office . . . . . **Santiago de Cuba**

Industrial Briefs

New Quarters—BLISS & LAUGHLIN, INC. has moved its Milwaukee district sales office to 1324 West Wisconsin Ave.

Announcement—New executive offices of CLAUDE B. SCHNEIBLE CO. are located at 212 Stephenson Bldg., P. O. Box 81, North End Station, Detroit.

Order Awarded—An order totaling almost $9 million from the Ordnance Tank-Automotive Center, Detroit, for a sizable quantity of heavy duty, low-bed trailers and dollies, has been received by PRESSED STEEL CAR CO., INC.

Appointment—THE BAKER RAULANG CO. has appointed the Erie Equipment Co., Erie, Pa., as industrial truck sales representative in that area.

Railroad Bridge — An 800-ft long curved railroad bridge will be constructed over the Delaware River near Martins Creek, Pa., by Contracting Div., DRAVO CORP., Pittsburgh.

Construction—RUST FURNACE CO., Pittsburgh, will construct two complete fuel oil handling systems to serve the new Fairless Works' pipe mill of National Tube Div., U. S. Steel Co., at Morrisville, Pa.

Dedication—IBM PLANT 2 held ceremonies last month at their Poughkeepsie plant dedicating 2 new wings to the plant. Lt. Gen. Edwin W. Rawlings was one of the speakers. The big plant addition, built under a certificate of necessity, is given over entirely to Air Force production.

Centralization — GENERAL ELECTRIC CO. announced the centralization under its Defense Products Group of its far-flung atomic energy activities, including the plutonium plant at Hanford, Wash., and Knolls Atomic Power Laboratory at Schenectady.

Golden Anniversary — KING MACHINE TOOL DIV. of American Steel Foundries is celebrating its Golden Anniversary this year.

Moves—THE H. W. NORTH CO., Erie, Pa., has moved its headquarters and all divisions to 1701 Parade Street.

Moving Soon—TUBE DISTRIBUTORS CO., INC., Brooklyn, will move its warehouses and offices to Garden City, L. I., as soon as its new plant is completed by Cauldwell-Wingate Co., Inc.

Change Name — Motor Specialties Corp. has changed the firm name to BECK PRODUCTS CORP., Detroit.

Company Formed — Robert A. Joyce announces the formation of THE ROBERT A. JOYCE CO., Advertising & Marketing Service, with offices at 1107 Wick Ave., Youngstown.

In Operation — New plant of AMPEREX ELECTRONIC CORP. has been completed and is in full operation. Plant is located at 230 Duffy Ave., Hicksville, Long Island.

Expansion—CRUCIBLE STEEL CO. OF AMERICA has completed the enlargement and expansion program of testing and development facilities at Park Works.

Purchase Line—On the occasion of its 60th Anniversary, PHOENIX PRODUCTS CO., Milwaukee, purchased a new welding line, DryRod Electrode Oven, formerly sold by Philip Roden Co.

Acquires Company—NATIONAL DISTILLERS PRODUCTS CORP. is acquiring the business and assets of the Algonquin Chemical Co.

"He's in charge of discouraging junior executives."

Established — NOOTER CORP. has established the St. Louis Metallizing Co., to be located at 625 S. Sarah St., St. Louis. This company was formerly the Metallizing Div. of the corporation.

Engineering Service — COMPUTER CORP. OF AMERICA, New York, has inaugurated a service which furnishes solations to complex problems in dynamics for industrial organizations, government bureaus and researchers.

Completed Negotiations—The VOCALINE CO. OF AMERICA, INC., Old Saybrook, Conn., has completed negotiations for purchase of controlling interest of Bristol Motor Co., Inc.

Distributor Named—AMPCO METAL, INC., has appointed Western Oxygen Co., Seattle, exclusive distributor in that area.

Moving—ATKINS, KROLL & CO. are moving their offices to Subway Terminal Bldg., 417 South Hill St., Los Angeles, early next month.

Westinghouse Awards—Four sons of WESTINGHOUSE ELECTRIC CORP. employees have been awarded $2,000 "War Memorial Scholarships" by the firm so they can continue undergraduate study in the engineering or physical science fields. They are: William J. Grassmyer, Elmer C. Hanks, Jr.; William S. Minkler; and Charles P. West, Jr.

Appointment — ESCO ENGINEERING CORP., Detroit, has appointed M. C. Crawford Co., Los Angeles, as exclusive representatives for southern California and Arizona.

Precision Castings — POWDERED METAL PRODUCTS CORP. OF AMERICA, Franklin Park, Ill., has made available production facilities for precision castings made by the new shell molding process. The new precision casting line will be marketed under the name Die Mold Castings.

More Power — WESTINGHOUSE ELECTRIC CORP., Pittsburgh, will build what they claim to be the world's two largest transformers from the standpoint of power capacity for the new Tennessee Valley Authority Colbert Steam plant at Pride, Ala.

MAKE A TON OF SHEET STEEL GO FARTHER
Specify—
N-A-X
HIGH-TENSILE STEEL
... And
"MAKE YOUR PRODUCT LAST LONGER"

Containers and pressure vessels assure greater service when made of N-A-X HIGH-TENSILE steel. The durability of this low-alloy steel, its greater resistance to corrosion and abrasion, and its exceptional fabricating and welding qualities are important characteristics. The greater strength of N-A-X HIGH-TENSILE steel permits fabrication of containers from thinner sections—reducing costly deadweight to a minimum. If you are interested in effecting economies in barrels, drums or cylinders, investigate N-A-X HIGH-TENSILE steel.

GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division — Ecorse, Detroit 29, Mich.

NATIONAL STEEL CORPORATION

NATIONAL STEEL

Steel Shortage Hits Workers

Midwest industrial towns feel full strike impact . . . Flint has 15,000 idle . . . Chevrolet first to close . . . GM distributes vacation pay . . . 9000 on relief—By *R. D. Raddant.*

Steel-hungry industrial cities of the Midwest have begun to show disastrous effects from the prolonged steel strike. An industrial famine spread as manufacturing plants closed from lack of materials.

Hardest hit were cities dependent on auto production. Because of its tremendous appetite for steel sheets and bars, the automotive industry was probably the first to feel the steel shortage and the first to be brought to its knees.

A grim example of a city that felt the threat of becoming a ghost town is Flint. Of 60,000 people employed in manufacturing plants, more than 15,000 were idled by the middle of last week. An equal amount faced layoffs within 10 days and nearly all might be idle by the end of the month.

GM City—Flint is predominantly a General Motors city, industrially speaking. Buick Div., largest single plant in GM, is located there. It is the home of Chevrolet Manufacturing, two Chevrolet assembly plants, Fisher Body plants, and the AC Sparkplug Div.

The Chevrolet manufacturing plant was the first to be hit with full impact. Nearly all of its over 10,000 workers were drawing unemployment compensation checks. Buick continued to maintain production as did the Chevrolet assembly plant and Fisher Body. All these plants had laid off substantial percentages of employees and could only keep up the pace for a limited time.

To ease the situation, General Motors authorized the distribution of all vacation pay to hourly workers last week. This totaled about $7 million poured into the city in vacation pay.

In addition to authorizing the lump sum payments, GM was apparently channeling as much of its remaining steel as possible to keep Flint from collapsing completely.

State Aid Helps—The hardship on Flint, as in other Michigan cities, was softened by state unemployment benefits which, while not large, could keep most families in groceries. A maximum of $27 per week plus $2 for each dependent child up to four is provided by the Michigan Employment Security Commission.

At mid-week, the Flint unemployment claim load totaled 9000. Lag between figures of those drawing compensation and those unemployed is caused by a 1-week waiting period before a claimant can draw his first compensation. Before the strike effects hit, 1300 men were on the unemployed rolls.

Between state aid and the determined efforts on the part of industry to keep the city's economy alive, Flint would not be broken, but it was already severely bent.

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS	TOTAL
July 19, 1952	28,073*	4,229*	32,302*
July 12, 1952	58,573	12,019	70,592
July 21, 1951	102,304	29,304	131,608
July 14, 1951	92,078	25,669	117,747

*Estimated

Source: *Ward's Reports*

Ford Loses, Wins—In its battle with National Production Authority to gain a bigger share of the auto industry's total output, Ford Motor Co. lost the decision but won the fight.

An NPA appeal board handed down a decision based on hearings in May overruling Ford's request for a boost in car production.

But it was generally agreed that during the hearings Ford made such gains in publicity on 1952 models that they outweighed the loss of the decision.

Academic—As a matter of fact, the steel strike, which will cut back all auto production severely for the rest of the year, made the ruling academic.

Ford originally requested its share of passenger car production to be raised to 23.4 pct from 21 pct. It also asked boosts in truck production. Every competitor except General Motors and Studebaker got into the act in opposition. Loudest opposition came from Chrysler which would have lost its second place position in the production race to Ford had the appeal prevailed.

The NPA decision observed that Ford's argument of hardship was "anticipatory rather than present," and that "Ford has not fared badly as a result of the basis chosen for controls."

Court Action—Ford spokesman William T. Gossett, vice-president and general counsel, said the decision "does not change the firm conviction of Ford that it is not receiving a fair share of materials." He broadly hinted of court action to keep the issue alive.

For the third quarter of the

year, a maximum of 1,150,000 cars was set for the industry. Because of the strike, auto production will fall far behind that level. Fourth quarter allotments are now expected to be about 80 pct of the third quarter total.

Car Air Conditioning Announced

It was no coincidence that General Motors chose the peak of a nationwide heat wave to announce that air conditioning units will be available in 1953 Cadillacs and Oldsmobiles.

Unit air conditioners for automobiles have been the subject of many predictions recently.

Just whether or not air conditioning becomes a general thing in the auto industry probably depends on the price and its practicability.

Units will be produced by Frigidaire Div. of GM. Principal mechanism will perch on a shelf in the rear of the trunk compartment. A single control will be placed on the dash with temperature controlled by a thermostat.

GM boasts that heat inside a car that has been standing in the hot sun can be dropped to a comfortable level within six city blocks. System provides for adequate cooling at low speeds.

In the cooling system, a rotary compressor is mounted on the engine. A sealed refrigeration unit, using non-toxic freon, is mounted in the trunk.

Trucker Gets Set for Strike End

On the list of bottlenecks that can be expected when the steel strike ends is the movement of steel itself to eager civilian and defense customers. Steel consumers can be expected to clamor all at once for immediate delivery of allotted steel.

Steel haulers don't intend to be caught flat-footed, however.

The George F. Alger Co., the nation's top steel carrier in terms of ton miles, is busy placing its steel carrying fleet of trucks in strategic positions to be able to get a flying start at the strike's end.

"The steel strike has given us a breathing spell which we did not necessarily need or desire, but we have taken advantage of it to deploy our steel-carrying equipment at points in the system where it will be ready," declared Ray F. Halloran, Alger's general freight agent.

Testing:

Oldsmobile checks car performance in many different sections of the U.S.

Most automobile tests are confined to the simulated conditions of the laboratory or the highly specialized conditions of the proving grounds.

Oldsmobile, however, makes the most of the best natural laboratory, actual driving conditions, in ironing out bugs in new models.

These are some of the areas on the Oldsmobile road testing program for this summer:

New York City, to test traffic handling, transmission operation, ventilation, engine cooling, and engine idling; San Francisco to test extreme metropolitan hill climbing; Phoenix, Ariz., hot weather operation; Pittsburgh, hydramatic drive; Pennsylvania Turnpike to test sustained speed, and Colorado to test high altitude, long grade climbing.

Same Conditions — "We regard road tests as particularly vital because they are made under the same conditions of terrain, traffic and weather encountered in business or pleasure driving," said Harold N. Metzel, Oldsmobile chief engineer.

A major test under way at the moment is going on in Chestnut Hill, Pa. In these tests, engineers are studying hill performance with various axle ratios. Measured distances up the steep hill are clocked and performance of different gear ratios studied. Object of the tests is to determine the correct axle ratio combining climbing ability with improved fuel economy.

THE BULL OF THE WOODS — **By J. R. Williams**

WHAT? ANOTHER MASHED FINGER IN TEN MINUTES? WHY, BY MORNIN' I'LL HAVE TO PUT YOU IN A SACK TO GIT YOU HOME -- YOU'LL BE HAMBURGER! WHAT DOPES!
NO, DINNY, I AIN'T LEFT YET -- WHEN YOU TRIMMED TH' LUMPS OFF THIS BANDAGE, YOU NEAR CUT THIS FINGER OFF!
TEMPLATES
MICROMETERS
TAPS
DRILLS - REAMERS
7-25
BORN THIRTY YEARS TOO SOON
T. M. Reg. U. S. Pat. Off. Copr. 1952 by NEA Service, Inc.
J.R.WILLIAMS

here's Latrobe's three-fold answer to your die production problems...

QUALITY CONTROL

Throughout the entire manufacturing process, the quality of "DESEGATIZED" Hi Carbon-Hi Chromium Die steels is constantly controlled. From initial chemical analysis to final inspection of finished product—test after test, after test. That is why the user of these, the very finest die steels, is guaranteed

- ease of die fabrication
- minimum heat treat hazard
- extra toughness
- superior die performance.

WAREHOUSE DELIVERY

Latrobe maintains warehouse stocks of "DESEGATIZED" Hi Carbon-Hi Chromium die steels at these nine strategic locations:

- Chicago
- Cleveland
- Dayton
- Detroit
- Hartford
- Los Angeles
- Philadelphia
- Toledo
- Latrobe (mill)

Daily teletype connections—warehouse to mill and warehouse to warehouse—make each of these your local warehouse. Toll calls are accepted free of charge from many other adjacent points (consult the yellow pages of your telephone directory).

TECHNICAL SERVICE

Latrobe's metallurgical laboratory, completely modern, is staffed by technicians experienced in both the metallurgy and the application of die steels. These men can be of great assistance in the solution of production problems through

- Laboratory research into better steels
- Metallurgical analysis of die failures
- Disc inspection service
- Field service—selection of steels, proper equipment for working and heat treating assistance.

Production economy demands the best die performance! Select the best die steel for your next job—one of the "DESEGATIZED" Hi Carbon-Hi Chromium die steels!

SEND FOR THIS BOOKLET TODAY !

LATROBE STEEL COMPANY,
LATROBE, PA.

Please send me your folder regarding the "Selection and Use of DESEGATIZED High Carbon—High Chromium Die Steels".

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POSITION .....

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CITY..... ZONE..... STATE.....

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Formerly LATROBE ELECTRIC STEEL COMPANY

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Branch Office and Warehouses: BOSTON, BUFFALO, CHICAGO, CLEVELAND, DAY DETROIT, HARTFORD, LOS ANGELES, MILWAUKEE, NEW YORK, PHILADEL PITTSBURGH, ST. LOUIS, TOLEDO.

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Pressure Industry On Dispersal

Government again pushing decentralization of manufacturing facilities . . . Pet NSRB plan . . . Program delayed after Korea to make way for fast defense plant expansion—By G. H. Baker.

An old word is cropping up again in key government offices after having been kept more or less in the closet for the past year. The word is dispersal. It is being dusted off again because the government is getting ready to try a bit of pressure in swinging industry into line with its aims in this direction.

Industrial dispersion has been a major project with National Security Resources Board from the start. In brief, the idea is to have less concentration of important industrial facilities in one spot so that an enemy bombing attack would disrupt production as little as possible.

Obviously, it is not feasible, either physically or economically, for steel and other big industries to break up and scatter their existing facilities over the countryside. But NSRB's basic idea is that in building new or additional facilities construction should be, if at all possible, on locations 8-10 miles from the parent plant. If a bomb landed midway between, neither would be damaged; if it landed on one, the other would be safe.

Delayed — Military support has been behind the program and the White House has plugged for it. Industry was to be educated to the idea but the Korean crisis developed and dispersion had to take more or less a back seat while the big defense production and expansion program got under way. When the dust began to settle late last year, the matter was again brought up by Office of Defense Mobilization and Defense Production Administration. Both announced firmly that more attention would have to be paid to dispersal.

Nothing much happened—visibly, that is. But Jack Gorrie, who has taken over NSRB, ordered a check-up to see how matters stood. A spot check was made on about 900 expansion projects involving expenditure of $1 million and up and which came under the definition of dispersable. He found that industry had done a pretty good job.

The report showed that about 80 pct of "all new defense plants and major industrial expansions which had received rapid tax amortization certificates were located outside of central cities of industrial metropolitan areas."

Apply Pressure — Nevertheless, the government feels that with the expansion program well in hand it is time to try the pressure plan. Joe Fowler, head man of DPA, will carry the ball. He will be assisted by special groups set up in NSRB, ODM, DPA and Area Development Div. of Commerce Dept. They will consolidate requirements and do the programming, to be passed on to field organizations which, for lack of a better name, are now referred to as "local dispersion groups."

"If that thing goes off I'll say you've got something there."

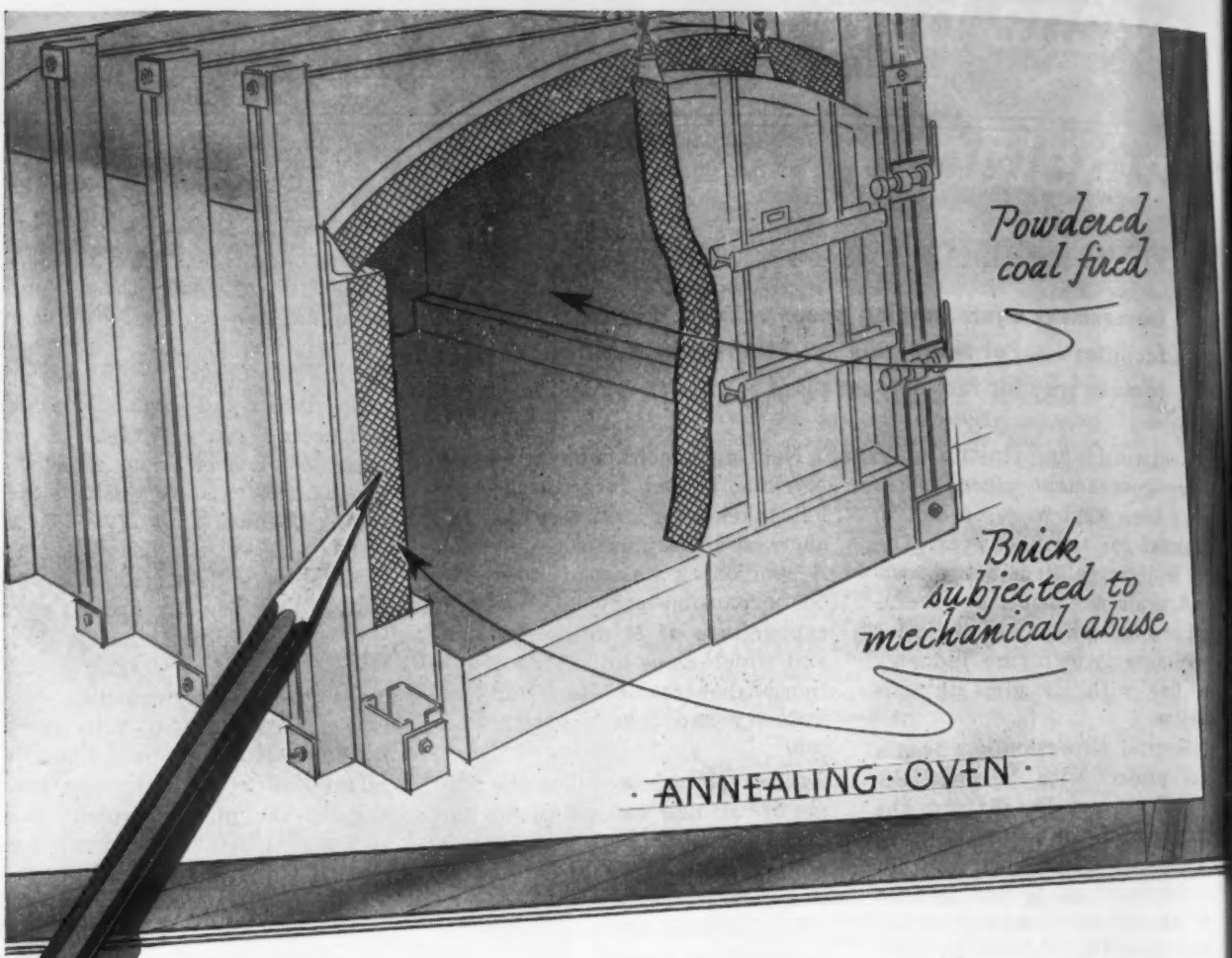
Some 60 or more of these groups have already been organized through Chambers of Commerce, Boards of Trade, etc. They will make studies and recommendations concerning "target security" of proposed plant locations. They will use as their guide the Commerce Dept.'s manual, *Industrial Dispersion Guide*, which has been prepared by its development group.

The pitch is, Mr. Fowler says, that in the future most applications for tax amortization certificates must be accompanied by a new form called Appendix B (to form DPAF-2). This will give a detailed listing of the precise location of the proposed plant with reference to other industrial locations. In addition, the form must be signed by an official of the local dispersion group certifying that the proposed facility location is in line with government dispersion policies. If there is no such local group (more are being organized), a sketch or map must be included to show the exact location of the proposed plant and other plants within a 10-mile radius.

Out of the Picture—Expansion of iron and steel production has just about dropped out of the picture insofar as tax certificate applications are concerned. Once accounting for about 70 pct of the whole, the industries have dropped to seventh place in recent weeks. Likewise, only about 10 pct of unprocessed applications are concerned with iron and steel.

Not so with a number of other industries requiring sizable amounts of steel products. These include transportation, warehousing and storage. In view of tightening restrictions, the going is getting tougher. Close to one-third of all applications are being turned down.

No More Appeals—Government contractors who have delayed ap-



Which insulating fire brick would you use?

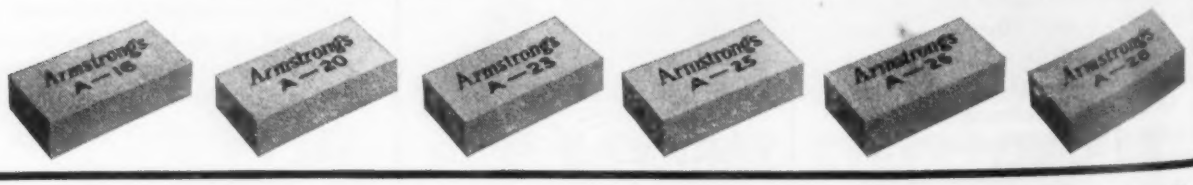
When it comes to selecting insulating fire brick for furnace linings, certain properties, in addition to the top temperature limit of the brick, must always be considered. In one application, resistance to special atmospheres may be important, while strength or spalling resistance may rate top place in another.

In this annealing oven, brick strength was the most important requirement of the insulating refractory lining. The brick selected had to stand up under the abrasive action of powdered coal. They also had to resist mechanical abuse of occasional bumping of annealing pots. Because of intermittent operation, spalling resistance was important, too.

Had top temperature limit of the brick been the only property considered, Armstrong's A-20's could have been used, as this furnace operates at a temperature below 2000° F. However, because of the rugged service conditions encountered, a stronger brick was needed. The choice was Armstrong's A-23's, the strongest brick in the Armstrong Line.

The great strength of A-23's resists the abrasion action of the powdered fuel, stands up well under mechanical abuse, and withstands the thermal shock of frequent door openings.

Next time you're faced with the problem of selecting insulating fire brick, call on the Armstrong engineer. His sound knowledge of insulating refractories and their uses may help you increase furnace efficiencies or cut manufacturing costs. Just call your near-by Armstrong office or write today to Armstrong Cork Company, 4907 Mulberry Street, Lancaster, Pennsylvania.



ARMSTRONG'S INSULATING REFRACTORIES

pealing unsatisfactory settlements of canceled war contracts will find themselves out in the cold unless action is taken within the next 3 weeks. Unnoticed in the congressional adjournment rush was the enactment of legislation setting a cutoff date.

It was promptly signed by the President, thus becoming Public Law 537 (82nd Congress) and automatically closing the door on appeals after Aug. 14. Pending settlements may be expected to be made quickly — Congress having provided that the appeals board also close shop within 9 months.

Alcohol, Soda Ash Stocks Good

No immediate shortages of either industrial ethyl alcohol or soda ash threatens, production officials said last week in releasing production goals for the 2 commodities.

Consumption by 1955 is estimated at 5.2 million short tons of soda ash and 410 million gal of industrial alcohol.

Soda ash capacity is already 500,000 tons in excess of the estimated requirements which are expected to level off and possibly decline after 1955 because of expanding production of electrolytic caustic soda.

Likewise, although the estimated industrial alcohol target was some 12 million gal short of capacity last year, expansion projects totaling 92 million gal are under way. Governmental assistance has been given to projects embracing 22 million gal of the planned expansion.

Civilian Steel Controls Relaxed

National Production Authority lifted restrictions on frozen steel stocks last week to permit manufacturers of consumer durables to take deliveries on steel not needed for defense production.

Specifically, an amendment to Dir. 12 of CMP Reg. 1 releases steel supplies not listed in Schedule 1 to be shipped on orders bearing the V allotment symbol.

MRO Items May Be Renegotiable

Materials carrying a maintenance, repair, and operating (MRO) symbol, considered as part or all of a defense contract, now are in the "possibly renegotiable" category, Renegotiation Board says.

A new document, Renegotiation Staff Bulletin No. 3B, moved the MRO symbol out of the "non-renegotiable" classification. Despite this action, it is expected most MRO sales will be non-renegotiable.

Staff Bulletin No. 3B lists discontinued and newly-added symbols and indicates likelihood of renegotiability. It may be obtained from Superintendent of Documents at 5¢ per copy.

School Building Funds Available

Federal Security Agency has lost no time in beginning to allot funds from its appropriation of $195 million for construction of schools in defense areas when materials become available.

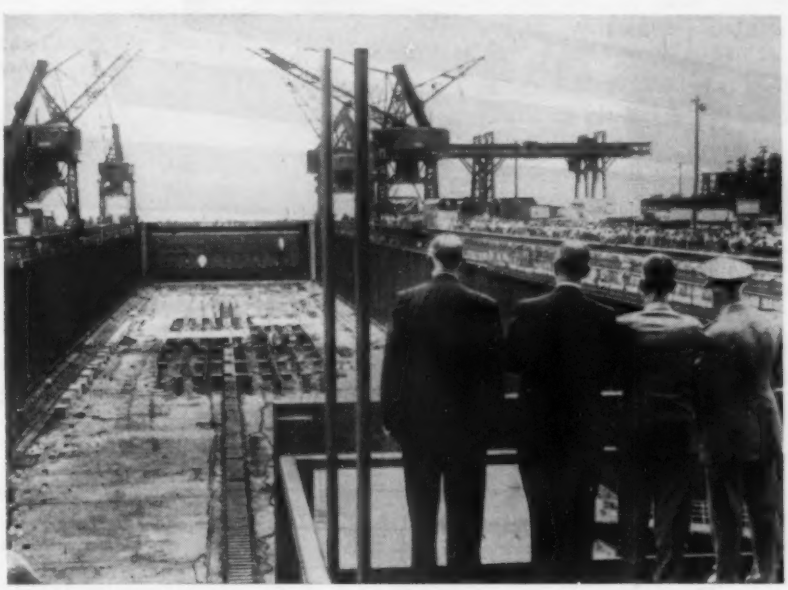
A report last week showed that more than $67 million has already been allotted and funds set aside for 579 other projects which have been Federally approved and need only to have technical problems worked out.

U. S. Purchases Boosting Output

Defense production in Western Europe should be stimulated by continued U. S. procurement of military supplies in that area, which obtained about $684 million in contracts during fiscal 1951-52.

Roving Ambassador William H. Draper, Jr., voiced this view in evaluating the effect of off-shore procurement for both our own and other North Atlantic Treaty Organization nations. Speaking as the Administration's special representative in Europe, he said:

"The contracts are payable in dollars and should permit the importation from the dollar area of additional raw materials, machinery and other goods for increasing the countries' own defense production effort and for maintaining or raising the civilian standard of living."

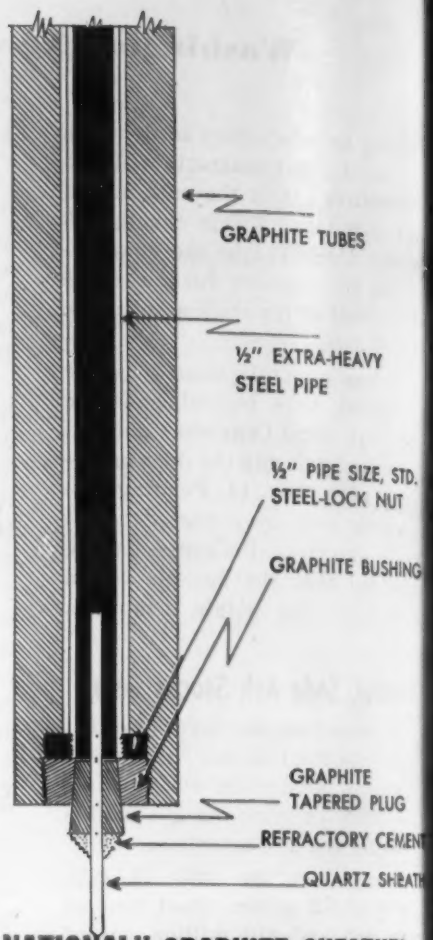


KEEL: Watching a keel plate being placed for the new carrier Forrestal are: (left to right) Navy Secretary Dan A. Kimball, Deputy Defense Secretary William C. Foster, executive vice-president of Newport News Shipbuilding & Dry Dock Co. William E. Blewett, and Capt. L. F. Gerhart, Atlantic Fleet chaplain.

In Furnace and Foundry...

These SMALL PARTS do a BIG JOB

● High temperature applications of "National" Carbon and Graphite are not limited to big-tonnage items. A part of National Carbon's service is to develop *any* application, however small, where the unique properties of carbon and graphite assure a convenience and economy to the user. In the following two instances, a few *pounds* of graphite serve literally *tons* of metal . . . efficiently and at a saving.



"NATIONAL" GRAPHITE FLUXING TUBES

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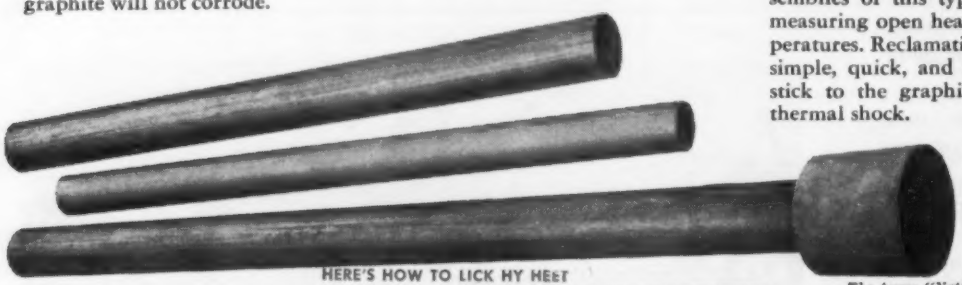
"NATIONAL" GRAPHITE-SHEATHED THERMOCOUPLE ASSEMBLY (Typical)

Only graphite could provide the degree of low-cost trouble-free protection required by thermocouple assemblies of this type for the immersion method of measuring open hearth and electric furnace bath temperatures. Reclamation and maintenance for re-use are simple, quick, and economical. Molten metal won't stick to the graphite parts and they're immune to thermal shock.



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Steel Shortage Still Hitting West

Direct wage loss now totals $15 million . . . Auto assembly, electric motor, aviation plants hit hard . . . No pipe for oil fields . . . Two carrier conversions for West—By T. M. Rohan.

The steel strike continued to take its toll of western manufacturing last week and posed an increased threat to the canning and airplane industries and even San Francisco's famed cable cars which have withstood onslaughts of efficiency experts for years.

Direct loss of wages among steelworkers and supporting fields for the three largest operating western producers hit $15 million at the week's end.

Auto Plants—Automobile assembly was almost nil. Latest shutdown was Studebaker at Vernon, Calif., near Los Angeles, "for the duration of the steel shortage." The plant, employing 600 workers, had been turning out 100 cars daily. Ford at Richmond, Calif., planned to reopen July 21 for only a week. General Electric's motor plant at San Jose, near San Francisco, which turns out all GE single-phase motors to 5 hp and verticals to 1000 hp, said they could hold out only to the start of the vacation shutdown July 28. Full resumption was not planned without new steel. The transformer plant at Oakland was similarly affected. Closings of smaller plants were commonplace everywhere.

And Aircraft—In Los Angeles Wm. DeWitt C. Ramsey, president of the Aircraft Industries Assn., said: "On Aug. 1 a significant number of parts and component manufacturers will be seriously affected from a lack of steel. This trend is expected to snowball until Sept. 15 when it is believed there will be a complete stoppage of jet engine production and delivery. Although airframe manufacturers have enough high alloy steels for day to day requirements they are still being affected by not being able to obtain immediate delivery of all sizes and types of high alloy steel necessitated by design changes occurring during production."

In west Texas 30 pct of the oil well drilling rigs are down for lack of pipe and the goal of 25,000 new wells in the last half of 1952 was made impossible.

Fear Crop Loss—California tin can manufacturers met to determine ways of averting loss of crops. Apricots are in, but peaches, pears, fruit cocktails and tomatoes are threatened.

Continental Can Co. said "only a prompt resumption of tin plate production can avert a major loss of essential foods." Pacific Can Co. (supplied principally by Weirton) was more optimistic saying stocks on hand and in transit were sufficient to finish the year out.

Washington state canners fear half that state's crop may be lost. Supplies are already so low that only half of the crop through Aug. 15 can be handled. Large hospital and restaurant size No. 10 cans were available, however.

The Alaska salmon industry played it smart and hauled tin cans north in fishing boats so supplies are adequate.

And in San Francisco the gripmen on the tiny cable cars were warned to be gentle to avoid wearing out the cables which are only good for 3 to 10 months.

". . . On second thought, I'd like a job with more future in it."

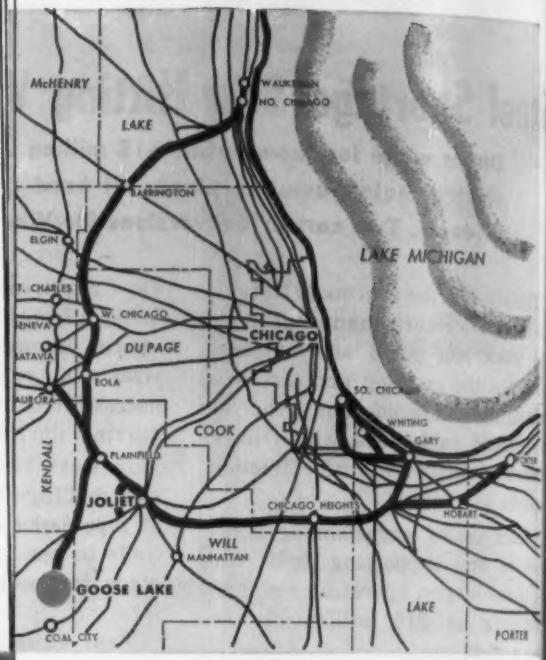
Plans for West—The San Francisco naval shipyard last week appeared to have a fighting chance of getting a Forrestal-class super carrier contract and meanwhile was given a $62 million sedative.

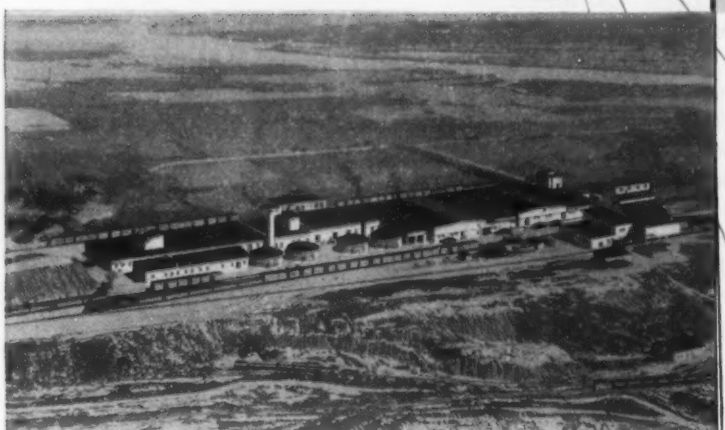
Although on very "iffy" ground, Rep. Franck R. Havenner (D. Cal.) of the House Armed Services Committee said the contract for the third 59,000-ton carrier would go to the West Coast yard. Congress, however, has not yet authorized a third ship, has not appropriated the $209 million necessary and will not meet to do so until 1953. Havenner pointed out, however, the committee is on record favoring West Coast building. Navy Secretary Dan Kimball has tentatively promised it and the yards are adequate although help is somewhat inexperienced.

The Forrestal-class carriers, 6000 tons heavier and three times as expensive as the new superliner, *United States*, are especially needed for fast launching of limited-range jet fighters and heavier bombers. With four elevators and four catapults they can launch eight planes per minute.

Get Conversions — Meanwhile the decks were cleared for a $62 million conversion job of an undesignated Essex-class carrier, now in mothballs, into a 40,000-ton ship capable of handling all but the largest planes. The conversion will take a year, employ 3400 workers and prove valuable training.

ILLINOIS CLAY PRODUCTS HAS ALL 3





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The Illinois Clay Products Company, Goose Lake Plant, is located near Joliet, Illinois—only 55 miles from Chicago. Above is a map showing the excellent shipping facilities provided by the Elgin, Joliet & Eastern Railway—the Outer Belt Line.

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Illinois Clay Products Company

SINCE 1911 JOLIET, ILLINOIS

Strike-Caused Shutdowns Start

Steel lack forces production cutbacks . . . Auto plants badly hit . . . Vacation schedules pushed up . . . Workers told to stay home 'til called . . . Thousands idled—*By F. Sanderson.*

Chief topics of conversation among Canadian industrialists today are the U. S. steel strike, threat of a steel strike at home and steel shortages, both real and prospective.

The automotive industry has cut back production sharply because of lack of steel. To stretch out supplies most automakers have pushed up vacation schedules. Thousands of workers have been released for holidays which otherwise would have been strung out over a month or more. They were told as they left not to come back until called, even though their paid vacations were over. Plants apparently will stay closed until fresh steel supplies are available.

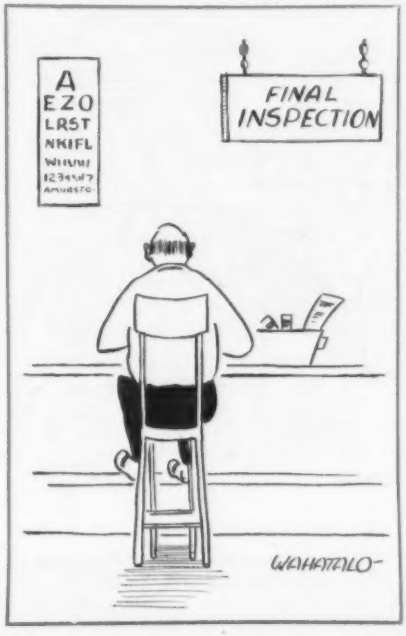
Idle Workers—In Ontario three auto firms have cut operations, idling 4500 workers. Affected plants are Chrysler Corp. at Windsor, which has completely shut down; General Motors Corp., Oshawa, 1100 workers idle; and Studebaker Corp., Hamilton, where 800 workers have been sent on vacation. Ford is working on a day-to-day basis at Windsor. One official there said it was impossible to predict the future.

Other industries are also affected and layoffs have started. New construction work is being postponed until steel supply pipelines are refilled.

Premature—It seems that Great Britain is getting ahead of itself in looking for big orders for steel and other goods for an all-Canadian St. Lawrence Seaway. Reports from England say that seaway orders will have top priority. But Ottawa says it will be at least 12 months before anything definite is available about construction of the project and contracts are let.

Recoup Loss—Officials of Steep Rock Iron Mines are confident they will be able to make up the loss of some 200,000 tons of iron ore shipments caused by the need for an excessive amount of stripping at the beginning of the season. While the company has reached as high as 12,000 tons for a single day it is believed an average of 8500 tons daily can be maintained. As of July 7th, shipments this season totalled 256,948 tons against 456,300 tons to the same date a year ago.

With the sharp cut in deliveries of iron ore from the U. S. to steel mills in the Hamilton district, it has been suggested that ore from the Steep Rock mines be diverted to this area instead of to its American destination. So far no reports have been forthcoming from Steel Rock officials or the steel interests that this would be done.



Output — Production and shipments of primary iron and steel shapes are holding slightly above the level of 1951. Outlook favors a substantial increase for the closing months this year if present conditions in the steel industry regarding strikes and iron ore shortages are ironed out quickly.

For the month of April production of primary iron and steel shapes totalled 420,805 net tons, including 156,746 tons delivered under producers' interchange; for March production amounted to 418,341 net tons with 152,350 tons for producers' interchange. In April, 1951, production amounted to 414,966 tons with 145,517 tons for producers' interchange.

Shipment of primary iron and steel shapes for sale in April, 1952, totalled 268,979 net tons, compared with 260,323 tons in March and 265,431 tons in April, 1951.

Wanted to Buy — The Hanna-Hollinger iron ore development in the Labrador area is in the market for some $250 million of production machinery and equipment. About $100 million of this is expected to be provided from the U. S. To expedite purchases from the States Canadian government has been asked to lift import duties. Equipment involved is largely items not readily obtainable in Canada.

Request for lifting of import duties is not the first instance of the kind in this country. There have been other cases where duty drawbacks have been permitted when a Cabinet order is issued declaring the project to be "for the general benefit of Canada." It is understood by some officials that, whether or not the order is made at an early date, the iron ore development company will be advised to proceed on the basis of a favorable finding at a later date when production starts.

No Steel Shortage for Tool Builders

High priorities and increased cancellation rate built up reserves . . . Stocks of required steel types still in warehouses . . . Floods threaten tool production—By G. Elwers.

The steel strike hasn't provided a major worry yet for most machine tool builders. Their high priority to get what steel has been available in warehouses has enabled them to build up the quality and balance of their stocks. And, cancellations have reduced the drain on the stocks they had built up on the basis of orders received.

No Panic—And now, even though steel production has virtually halted, there has been little panic buying by industry in general. Warehouses have not been drained of the types of steel machine tool builders need. High priority combined with modest demand has prevented major difficulties in getting steel from warehouses, so far.

A factor holding the industry's steel needs down at present is the vacation schedule in machine tool plants. Many follow the practice of shutting down completely for two weeks. This normally is done sometime during July.

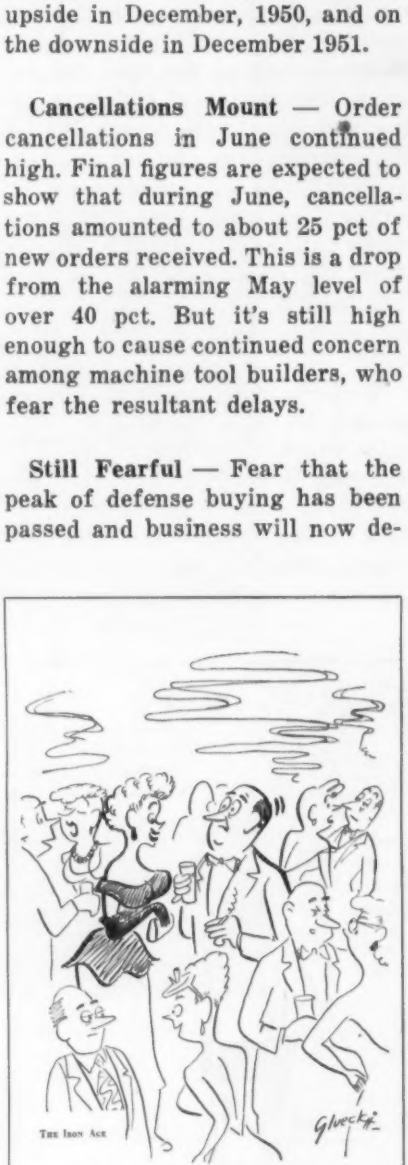
Floods—A more pressing problem in one machine tool area is water. Floods around Rockford, Ill., are reported to have hampered and in some cases halted production in machine tool plants. And Rockford is one of the nation's leading machine tool production areas.

Orders Up—New orders for machine tools apparently took a sharp upswing during the month of June. Preliminary reports to the National Machine Tool Builders' Assn. indicate a June new order index level of 352, compared to the May value of less than 290.

This upswing reverses a steady decline which began last December, and saw the index drop from 376.5 to 286. New order peak, since Korea, was an index level of 615 in February of 1951. The current 352 level was passed on the upside in December, 1950, and on the downside in December 1951.

Cancellations Mount — Order cancellations in June continued high. Final figures are expected to show that during June, cancellations amounted to about 25 pct of new orders received. This is a drop from the alarming May level of over 40 pct. But it's still high enough to cause continued concern among machine tool builders, who fear the resultant delays.

Still Fearful — Fear that the peak of defense buying has been passed and business will now decline to peacetime levels has not been entirely eliminated by reassuring statements from Washington.



"You're in machine tools? Gee, you must be real rich, huh?"

Washington says there are just as many machine tools to be bought for defense as before. The decline in orders is only due to the stretch-out in military procurement plans. Builders ask why, then, are cancellations so high?

Overextended? — To the industry, cancellations and declining new order levels are not merely a concern because they mean lower earnings. At present the industry is continuing to operate at an extended production rate, utilizing all possible means to keep production up, often at unusual cost. Subcontracting, leased tools to increase plant capacity, high-pressure labor recruiting, extra shifts and all the other expedients to raise production are expensive and troublesome.

With all this the big question is, is this necessary? If the hump is passed, if the urgent need for machine tools is slackening, the industry wants to be able to return to more normal production practices. The feeling among many is that it is foolish to rush headlong toward high output if the need is declining. It only accentuates the severity of the eventual fall.

Playing Safe—Washington, on the other hand, doesn't want the industry to slow down at all. That is believed to be not, contrary to the tone of official statements, due to confidence that the need for high machine tool production will continue for a long time. Many think that Washington actually doesn't know.

But, remembering the severe tool shortages immediately after Korea, Washington fears the same thing will happen again if demand suddenly goes up after production has slowed down.

The Iron Age INTRODUCES

George McCuskey, becomes assistant to the president, THE YOUNGSTOWN SHEET & TUBE CO., Youngstown.

William M. Frame, appointed executive assistant, operating department, National Tube Div., UNITED STATES STEEL.

R. S. Stevenson, elected executive vice-president, ALLIS-CHALMERS MFG. CO., Milwaukee.

Carl S. Abbott, appointed vice-president and general manager, J. N. FAUVER CO., INC., Detroit; and **John W. Fauver,** appointed vice-president and sales manager.

H. J. Leaver, appointed assistant to the president, TREADWELL ENGINEERING CO., Easton, Pa.

Frank Pavlicek, appointed treasurer, assistant to the president and a member of the board of directors, THE SANYMETAL PRODUCTS CO., INC., Cleveland.

Ray A. Mentel, named vice-president and general manager, REPUBLIC HARDFACING CORP., Bedford, Ohio.

Howard B. Steggall, appointed senior vice-president, UNITED STATES RADIATOR CORP., Detroit.

Stanley W. Ostrander, elected vice-president — Basic Products Group, FORD MOTOR CO., Dearborn.

Harold W. Schaefer, appointed vice-president-engineering, Refrigeration Div., PHILCO CORP., Philadelphia.

Robert W. White, elected a director, AMERICAN LOCOMOTIVE CO., Schenectady.

George Robinson, joins the staff of ARTHUR D. LITTLE, INC., Cambridge, Mass.

K. C. Sheard, appointed training director, THE R. K. LEBLOND MACHINE TOOL CO., Cincinnati.

Walter Sokolofsky, appointed foundry service engineer, Plastics Div., MONSANTO CHEMICAL CO., Springfield, Mass.

Roger M. Carroll, appointed chief engineer, Welin Davit & Boat Div., CONTINENTAL COPPER & STEEL INDUSTRIES, INC., New Jersey.

J. O. Tompkins. appointed assistant chief metallurgist, KEYSTONE STEEL & WIRE CO., Peoria; and **Harold Fales** has been designated wire mill metallurgist.

Richard J. Schumann, appointed vice-president in charge of manufacturing, Airtemp Div. Plant, CHRYSLER CORP., Detroit.

Karl C. Ruppenthal, named technical supervisor, newly formed Fine Chemicals Div., PITTSBURGH COKE & CHEMICAL CO., Pittsburgh.

Harold W. Whiting, appointed assistant to the executive engineer, WORTHINGTON CORP., Harrison, N. J.; **W. A. Scheerer,** appointed chief engineer, Compressor Div.; **W. J. Blessing,** named consulting engineer; and **W. M. Kauffman,** named chief engineer, Engine Div.

J. Louis Irwin, promoted to supervisor of Safety and Personnel Service Dept. LUKENS STEEL CO., Coatesville, Pa. He succeeds his father, George K. Irwin who has retired.

C. J. Berini, appointed division manager, Wayne Div., GAR WOOD INDUSTRIES, INC., Wayne, Mich.

John P. Burrows, appointed general purchasing agent, INTERNATIONAL MINERALS & CHEMICAL CORP., Chicago.

C. J. PLISKY, appointed vice-president in charge of production, Pressed Steel Car Co., Inc., Pittsburgh.

L. D. WEBSTER, elected vice-president in charge of employee and public relations, Lone Star Steel Co., Dallas.

FRANK B. McKOWN, appointed vice-president, Kennecott Sales Corp., New York.

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Personnel

Continued

Richard T. Johnstone, appointed chief draftsman, SNYDER TOOL & ENGINEERING CO., Detroit.

Hugh C. Sealey, appointed sales-service supervisor, THE BAKER-RAULANG CO., Cleveland; and **Walter E. Schoch,** appointed service department manager.

Thomas J. Menzel, appointed plating chemist, HANSON-VAN WINKLE-MUNNING CO., Matawan, N. J.

Harvey R. Engle, promoted to works chemist of the Works Laboratory, HOOKER ELECTROCHEMICAL CO., Niagara Falls, N. Y.

Thomas M. Desmond, appointed manager, Metals Dept., PITTSBURGH INTERNATIONAL TRADING CO., New York.

Norman F. Trost, appointed quality manager, Aeroproducts Div., GENERAL MOTORS CORP., Dayton,

William F. Hauserman, appointed district manager, Los Angeles office, E. F. HAUSERMAN CO., Cleveland.

Warren S. Mann, appointed manager, Dixie Div., ARMCO DRAINAGE & METAL PRODUCTS, INC. He succeeds Howard See, who has retired.

Herbert Schwartz, appointed production manager, DACO MACHINE & TOOL CO.

Robert Johnson, appointed product engineer, NATIONAL ELECTRIC PRODUCTS CORP., Pittsburgh.

W. A. Eger, promoted to assistant sales manager, THE AMERICAN BOX CO., Cleveland.

John A. Goodwin, appointed general manager, MORRISON ENGINEERING CORP., Cleveland.

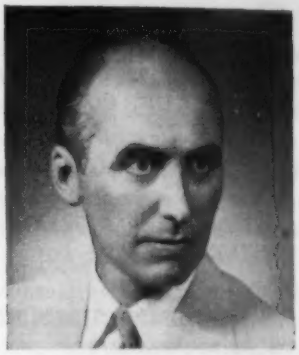
David W. Martin, appointed district sales manager, Atlanta, Ga., office, THE YOUNGSTOWN SHEET & TUBE CO., Youngstown.

Edward A. Hassan, Jr., appointed manager, Raw Materials Dept., KAISER ALUMINUM & CHEMICAL CORP., Oakland, Calif. He succeeds the late M. B. Lovelace.

Joseph V. Kielb, appointed production manager, TENNEY ENGINEERING, INC., Newark, N. J.

Frank E. Ray, Jr., promoted to purchasing agent WICO ELECTRIC CO., Springfield, Mass.

HAROLD A. STRICKLAND, JR., becomes vice-president and manager, engineering, Hotpoint Co., Chicago.



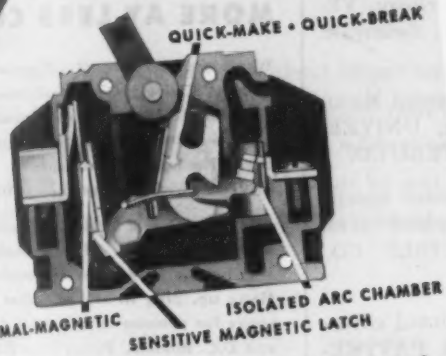
HERBERT B. JEFFREY, promoted to assistant vice-president and assistant treasurer, Great Lakes Steel Corp., Ecorse, Detroit.

ARTHUR C. BRYAN, appointed vice-president in charge of sales, National Carbon Co.

J. B. O'CONNOR, appointed vice-president and manager of new product development, Illinois Tool Works, Chicago.

SQUARE D's NQB LIGHTING PANELBOARDS offer you these important advantages:

LESS "DOWN TIME"



"DOWN TIME" is minimized because of important QB breaker design features. Resistance to vibration results from the stainless steel latch being independent of the trip element. Thermal *(coilless)* magnetic trip affords 2-way protection. Thermal element holds harmless momentary overloads but trips if excessive current continues. Magnetic element responds instantly to heavy overloads or shorts. Simple reset operation restores service quickly when the breaker trips.

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New Trim Clamps
Self-positioning visual indication of clamp position speeds installation.

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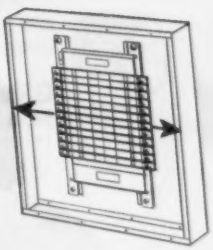

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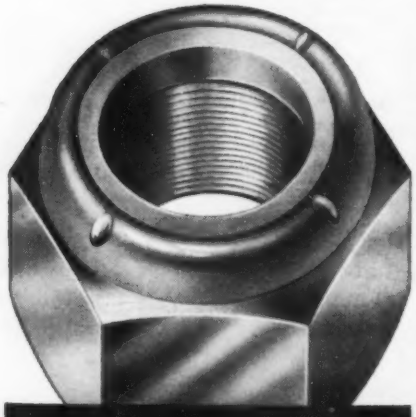

GREER Stop Nuts

—Personnel—
Continued

George H. Sanborn, named sales manager, THE FELLOWS GEAR SHAPER CO., Springfield, Vt. He succeeds Leroy C. King, who has retired. **Henry B. Flinn,** appointed publicity manager, succeeding Douglas T. Hamilton who has also retired.

Stanley C. Johnson, appointed chief abrasive inspector, NORTON CO., Worcester. He replaces **Harry O. Anderson** who has retired.

Donald S. Campbell, appointed technical representative, AiRESEARCH MFG. CO., Los Angeles.

Richard H. Clay, appointed manager, Engineering Service Dept., A. M. BYERS CO.

S. C. Williams, appointed general field sales manager, PYRENE MFG. CO., Newark; and **Walter W. Kemphert,** appointed Mid-West district manager.

J. S. Ure, appointed general credit manager, JOSEPH T. RYERSON & SON, INC., Chicago.

Alexander C. Hauck, appointed sales representative, central territory, VESUVIUS CRUCIBLE CO., Swissvale, Pa.

A. W. Winchester, appointed Michigan sales representative, UNIVERSAL SHEET & STRIP STEEL CO.

Ralph C. Gough, appointed special representative, New England area, JOSEPH DIXON CRUCIBLE CO., Jersey City.

Wynn T. Sullivan, appointed advertising manager, HEYL & PATTERSON, INC., Pittsburgh.

Robert P. Kloeckner, appointed sales representative, FAGEOL HEAT MACHINE CO., Detroit.

OBITUARIES

Arnold W. Lenz, vice-president, General Motors Corp. and general manager, Pontiac Div.

Frank M. Hesse, 57, vice-president and treasurer, National Steel Corp., recently, in Pittsburgh.

Ralph B. Jones, 56, sales service manager, The Osborn Mfg. Co., suddenly in his home in Cleveland.

William Luther Lewis, president, Chicago Pneumatic Tool Co., New York, in the Northern Westchester Hospital, recently.

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Carbon wire with alloy frosting—

The Iron Age
FOUNDED 1855
Technical Articles

Ferritic welding electrodes SAVE ALLOY GIVE BETTER WELDS

By Z. J. Fabrykowski
Chief, Welding Section
Detroit Arsenal

Savings in strategic alloys of about 85 pct have been obtained by using ferritic rods instead of austenitic rods by Army Ordnance. The practice is being used on U. S. military vehicles on thicknesses up to 5/8 in. where ballistic tests must be met. The rods are low in hydrogen and all major alloying elements are in the coating.

The use of ferritic welding electrodes, developed through a cooperative electrode research and welding application program by Army Ordnance, the Navy, other armed services and civilian industry, will bring about a saving of 85 pct of the critical alloys that would otherwise be required to fabricate a U. S. military vehicle.

Considerable ferritic welding has been and is being performed. The outlook for using these electrodes for fabrication of armored vehicles is highly promising. These electrodes have demonstrated unusual characteristics and excellence in large test weldments.

In certain respects, the physical properties of ferritic weld metals are better than highly alloyed austenitic weld metals normally used in armored fabrications. Ferritic electrodes do not result in undesirable high hardness, martensitic structures, in or at the fusion line, which are characteristic of welds made with austenitic electrodes when welding armor which is responsive to heat treatment.

Although ferritic electrodes of the Ni-Mo-V type do not respond to heat treatments as well as the Mn-Mo electrodes, in a general sense they lend themselves better to heat treatment than austenitic welding rods. Higher temperatures must be used, of course, for stress relief treatments, to retain high impact values.

An additional advantage of ferritic electrodes of the low hydrogen type is that the necessity of maintaining a large inventory of special purpose welding electrodes is eliminated.

Ballistic properties of today's tanks are equivalent or better than previous models. Permissible applications of ferritic welding to military vehicles include the following: low hydrogen, high strength ferritic electrodes may be used for fabrication of military vehicles without restriction to material thickness up to an including 5/8 in., where ballistic requirements must be met.

Ferritic electrodes also have limited application on heavier sections. They may be used to fabricate external components of the main hull

"May be specified where . . . high strength and good impact properties are required . . ."

of the vehicle. They may also be specified for fabrication of assemblies of alloy steels where high strength and good impact properties are required, providing the procedure is approved in advance by Ordnance.

The savings in pounds of alloy are tremendous. These savings are shown in Table I, which compares the pounds of alloy needed for welding tank armor, using three different types of welding electrodes. Figures are based on the weight of electrode (1100 lb) required to fabricate an average hull of a military vehicle.

The first use of ferritic electrodes for armor occurred during World War II. Until recently this information has been classified. Increased availability of the new ferritic materials and the need to conserve alloy have made it advantageous to publicize this development.

The development of an electrode that is low in alloy content, particularly for application to military vehicles, was initiated during World War II. The project was carried out under the jurisdiction of the National Defense Research Committee. A result of the research project was the development of a low-hydrogen, high strength electrode of a Mn-Mo type. This was known as the NRC2A electrode and brought into existence Specification AXS-1450.

These electrodes were successful, with minor exceptions, and ferritic electrodes were adopted immediately for limited application where the ballistic quality would not be jeopardized.

The development of the NRC2A electrode was timely, since the production of large armor castings necessitated repair by welding in order to salvage castings containing huge tonnages of critical alloy steel. Use of these electrodes permitted repair welds to be closer (as welded) to the physical requirements of the Army and still permit heat treatment of weld metal deposits.

At the end of World War II, a contract was placed by Army Ordnance to continue the development of ferritic electrodes. At the same time the Navy organized an industrial committee of electrode manufacturers to work on development of low hydrogen ferritic electrodes for replacement of austenitic electrodes for Navy use.

The Navy-Industry development resulted in Specification MIL-E-986 during the present emergency. Concurrently with the issuance of the specification, development work was continued to determine the application of ferritic electrodes to military vehicles. The MIL-E-986 electrodes, Grades 230 and 260, possess properties that permit reduction of and, in some cases the elimination of, preheating armor. Since reducing preheats, while maintaining quality, helps production, MIL-E-986 have been widely applied.

TABLE I

ALLOY SAVINGS WITH FERRITIC RODS

GRADE V	
Element	(Lb)
Mn	38.27
Si	3.73
Cr	211.75
Ni	98.00
Mo	−0.11
V	−0.99
Total	350.65

GRADE VI	
Element	(Lb)
Mn	13.09
Si	3.63
Cr	211.75
Ni	88.00
Mo	16.39
V	−0.99
Total	331.76

TABLE II

ANALYSIS AND POUNDS OF ROD NEEDED

(BASED ON 1100 LB REQUIRED PER VEHICLE)

Austenitic (Grade V) Analysis

Element	Average Composition (Pct)	Weight Required 1100 Lb Vehicle (Lb)
Mn	4.03	44.33
Si	0.80 max.	8.80
Cr	19.25	211.75
Ni	9.85	108.35
Mo	0.55	6.05
	Total	379.28

Austenitic (Grade VI) Analysis

Element	Average Composition (Pct)	Weight Required 1100 Lb Vehicle (Lb)
Mn	1.75	19.25
Si	0.80 max.	8.80
Cr	19.25	211.75
Ni	9.85	108.35
Mo	2.05	22.55
	Total	370.80

Ferritic—Grade 230 (One Manufacturer's Analysis)

Element	Average Composition (Pct)	Weight Required 1100 Lb Vehicle (Lb)
Mn	0.56	6.16
Si	0.47	5.17
Cr		
Ni	1.85	20.35
Mo	0.56	6.16
V	0.09	0.99
	Total	38.83

Many combinations of core wire and coating have been investigated. The two basic analyses are as follows: World War II, NRC2A, Mn-Mo; the new ferritic Grades 230 and 260, are Ni-Mo-V.

The World War II electrode had a low hydrogen coating. All alloying elements except Mo were present in the core wire. Total water content in the coating averaged 0.40 to 0.90 pct.

The new ferritic electrodes also have a low

TABLE III

IMPACT PROPERTIES AS WELDED
Old Ferritic Rod (NRA-2A)

Size Electrode, In.	Impact (Ft-Lb)	BHN (3000 kg.)
3/16	25	212
3/16	34	217
3/16	29	217
3/16	43	217
1/4	21	212
1/4	23	217
1/4	25	217
1/4	24	228
5/16	17	196
5/16	16	192
5/16	29	192
5/16	20	196
Heated at 1125°F. ± 10°F. for 4 hours—Water Quenched		
3/16	41	179
3/16	38	187
3/16	38	187
3/16	42	228
1/4	34	196
1/4	35	183
1/4	38	187
1/4	41	183
5/16	45	187
5/16	30	183
5/16	43	179
5/16	43	179
Heated at 1125°F. ± 10°F. for 4 hours—Air Cooled		
3/16	27	187
3/16	28	187
3/16	31	192
3/16	24	192
1/4	25	196
1/4	23	192
1/4	25	196
1/4	20	196
5/16	40	179
5/16	51	179
5/16	56	174
5/16	41	179
Heated at 1125°F. ± 10°F. for 4 hours—Furnace Cooled		
3/16	47	187
3/16	46	187
3/16	42	192
3/16	24	187
1/4	30	187
1/4	23	187
1/4	32	187
1/4	37	187
5/16	26	170
5/16	30	170
5/16	36	170
5/16	31	170

TABLE IV

IMPACT PROPERTIES AS WELDED
New Ferritic Rod (Grade 230)

Size Electrode, In.	Impact (Ft-Lb)	BHN (3000 kg.)
3/16	21	277
3/16	29	262
3/16	26	269
3/16	29	277
1/4	32	223
1/4	30	217
1/4	30	223
1/4	30	217
5/16	26	212
5/16	23	217
5/16	21	223
5/16	23	223
Heated at 1125°F. ± 10°F. for 4 hours—Water Quenched		
3/16	22	229
3/16	16	223
3/16	18	223
3/16	21	229
1/4	11	241
1/4	10	248
1/4	8	235
1/4	11	241
5/16	9	241
5/16	8	241
5/16	16	241
5/16	9	241
Heated at 1125°F. ± 10°F. for 4 hours—Air Cooled		
3/16	18	217
3/16	9	229
3/16	15	223
3/16	10	223
1/4	15	248
1/4	12	241
1/4	8	241
1/4	10	241
1/4	19	223
5/16	8	235
5/16	11	241
5/16	8	241
Heated at 1125°F. ± 10°F. for 4 hours—Furnace Cooled		
3/16	10	223
3/16	7	229
3/16	5	229
3/16	5	235
1/4	11	241
1/4	9	241
1/4	5	241
1/4	5	241
1/4	7	241
5/16	5	241
5/16	9	235
5/16	4	235

hydrogen coating. However, *all* major alloying elements are in the coating. The core wire of both types is a low carbon grade, World War II type containing 0.10 pct to 0.17 pct C; the new type averages 0.10 pct C or lower. Total water content of the new ferritic Grade 230 is 0.4 pct, while Grade 260 contains 0.2 pct H_2O. Typical analyses are shown in Table II.

Electrodes now available are unusually versatile. However, there are some restrictions: (1) Electrodes are usable with DC power source only if present available commercial equipment is used. (2) The electrodes are more susceptible to cracking than austenitic rods, particularly in heavy sections which, due to increased joint restraint, are influenced to a greater extent by the presence of stress raisers. However, welding conditions, primarily preheat, can be adjusted. (3) Although the new ferritic rods can often be used with less preheat, heavier sections may require preheating, depending on welding conditions.

Ferritic electrodes for welding are described in Military Specification MIL-E-986A, Oct. 1, 1951, superseding MIL-E-986 (ships), Nov. 1, 1949. This specification applies to mineral-covered, low hydrogen welding electrodes for medium and alloy steels. Response to stress-relieving treatment is not a specification requirement.

U. S. Army Specification 57-203-7, Jan. 10, 1950, describes ferritic-covered, steel welding

"Outstanding physical . . . excellent ballistic properties have been reported . . ."

electrodes for welding high strength steels. This supersedes Ordnance Department Specification AXS-1450, Dec. 16, 1944. Response to stress relieve treatments is a specification requirement.

Tables III and IV show impact properties of undiluted-weld metal (Charpy V-notch at —40°F) at brinell hardness indicated. Specimens were obtained from non-restrained butt welds, single "V," 45° included angle, 1 in. root opening with mild steel backup. Bevels were clad with two layers of weld metal before welding the joint. For a 3/16 in. rod current used was 225 amps., for ¼ in., current used was 320 amps., and for 5/16 in., current used was 420 amps.

Numerous tests have been conducted on these electrodes by the Army and Navy. All tests conducted thus far have shown these electrodes to have outstanding physical properties. Excellent ballistic properties, both at room temperature and sub-zero, have been reported. Tests at sub-zero are not sufficiently extensive to prove conclusively that these electrodes are fully equivalent to the austenitic electrodes in heavier sections.

A typical photo macrograph of a 1½ in. rolled armor double "V" butt joint is shown in Fig. 1. Fig. 2 shows an armored vehicle T98E1, in the light armor fabrication class. This is one of the first vehicles to be welded with ferritic electrodes in this emergency by an industrial facility.

Fig. 3 describes the physical dimensions of the test piece for 1 in. thick armor. Fig. 4 pertains to test pieces 1½ in. thickness. No effort is made to describe the detailed operation in conducting a first pass crack susceptibility test with an electrode. The first pass crack susceptibility test "I" plate is being promulgated for use in evaluating electrode performance of so-called root welds, and has been used by the Army for such purposes.

Although the test specimen is historically related to other restrained tests such as the so-called miniature restrained "H" used for the NRC2A development work and the crack susceptibility test specimen described in U. S. Army Specification 57-205-5, the first pass crack susceptibility test "I" plate has been arranged and modified to fit the testing of only the first pass weld.

The significance of such a test can be appreciated since it is directly related to the open groove type joints used in armored vehicles. The test is based primarily on the fact that the first pass is the most difficult to make successful.

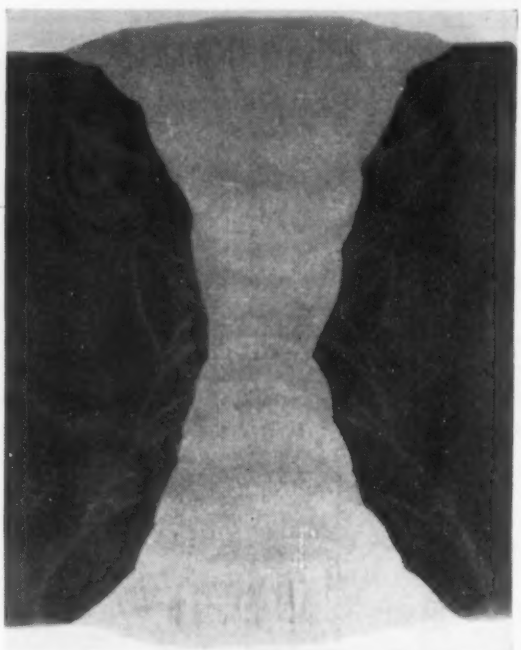


FIG. 1—Ferritic weld deposit in 1½ in. rolled armor. The electrode used was Grade 230, Mag 2X.

FIG. 2—A military vehicle in the light armor class. This is one of the first vehicles welded with ferritic rods.

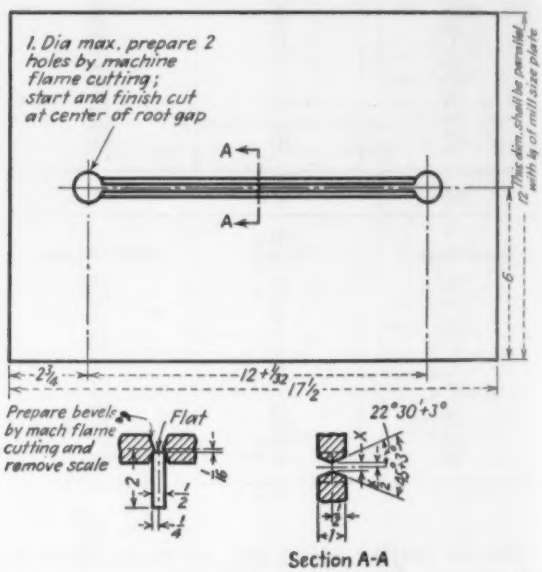

1. Dia max. prepare 2 holes by machine flame cutting; start and finish cut at center of root gap
A
A
12 This dim. shall be parallel with ky of mill size plate
6
2¾
12+1/32
17½
Prepare bevels by mach flame cutting and remove scale
Flat
22°30'+3°
Section A-A

FIG. 3—Drawing describing the test specimen employed in the First Pass Crack Susceptibility Test "I" 1-in. plate.

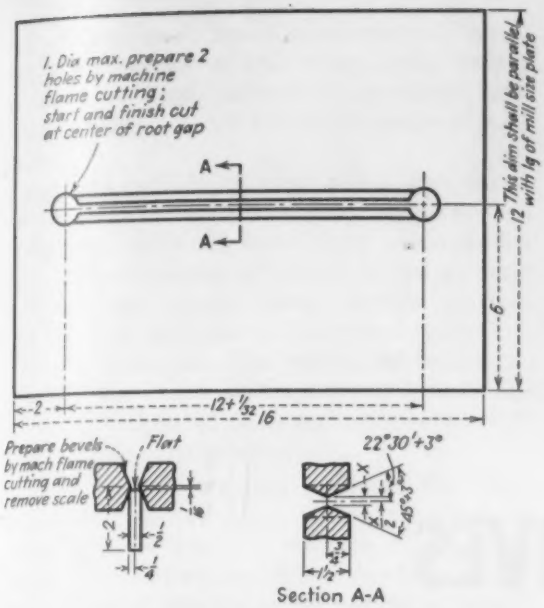


FIG. 4—Drawing describing the test specimen employed in the First Pass Crack Susceptibility Test "I" ½-in. plate.

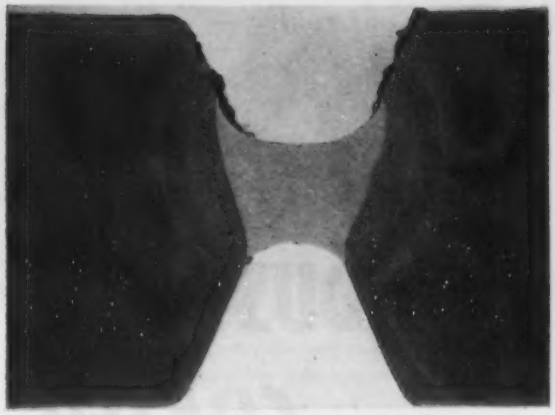


FIG. 7—Cross section of root pass weld. Etchant used 10 pct ammonium persulphate. Magnification was 3X.

cedure in its entirety; the number of plates is dependent upon the joints and other factors involved.

A test piece relatively large in size is a useful

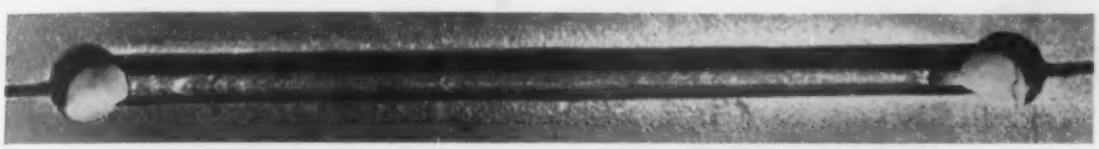


FIG. 5—First pass weld in typical root pass crack susceptibility test plate. This shows the back side of plate.

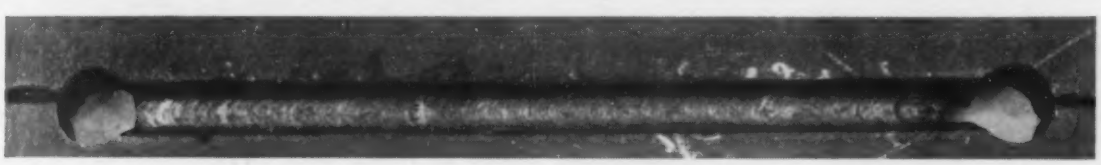


FIG. 6—First pass weld in typical root pass crack susceptibility test. This shows front side of the plate.

Once the welding factors become established for making the first pass successful, completion of a satisfactory joint becomes a function of studying and analyzing the factors previously established to make successful first pass welds.

The Detroit Arsenal has found the first pass crack susceptibility test "I" plate a suitable means of indicating the basis upon which to establish and control the welding factors required to complete satisfactory "H" plates. Figs. 5, 6 and 7 are photographs pertaining to the first pass crack susceptibility test.

An "H" plate is another qualification plate which is welded by the procedure employed in production to ascertain whether or not such welding practice will meet prescribed radiographic and ballistic requirements. A number factorily. This also provides a geometrical joint condition of suitable mass to evaluate not only the first pass weld, but all subsequent passes of such plates are required to qualify such promedium by which one can demonstrate the ability or inability of an electrode to perform satisrequired to complete the joint. Obviously, the large size test piece also makes it closely related to the conditions in armored vehicle weldments.

The "H" plate consists of two outward pieces measuring 12 in. x 36 in., and two inward pieces measuring 12 in. x 18 in., tackwelded and welded in such a way as to form a letter "H." The two parallel welds are referred to as *legs* and are welded first. The remaining joint, referred to as the *cross bar,* is welded last.

As is evident, the weld of the *cross bar* is under a very severe condition of restraint. When the completed "H" plate meets the prescribed radiographic requirements, it is subjected to ballistic testing. Thickness of the "H" plate and the chemistries (rolled or cast) are related to the armored vehicle or weldment involved.

Ferritic "H" plates up to 1 in. in thickness have been welded without preheat, and have performed satisfactorily at room and —40°F ballistic test conditions. Ballistic tests showed they were equal to or better than austenitic welded plates.

Abrasives get rolling—

Uses for INDUSTRIAL COATED ABRASIVES Expanded

Part I

By John E. Hyler
John E. Hyler & Associates
Peoria, Ill.

Coated abrasives have come a long way since the emery cloth days. Now aluminum oxide and silicon carbide abrasives dominate, coated on sheets, discs, belts, cylinders, and special shapes. Beside the familiar spindle and drum sanders and grinders, many specialized tools are available utilizing coated abrasives. Many machines have automatic cycles, indexing workholding fixtures, and other features designed to speed output.

Coated abrasive applications in metalworking were once almost entirely limited to moderate use of emery cloth. Now, there is wide use of aluminum oxide and silicon carbide abrasives. A small amount of crocus is used, chiefly for polishing soft metals. In a large degree, emery cloth has been displaced by aluminum oxide and silicon carbide.

These materials may be obtained in a wide range of grit sizes and types of backings. For the most part, abrasive belts are employed, and drills are largely used as backings. In some cases, paper-backed belts may be used for flat surfacing operations, where mechanical duty and application is not rigorous.

While belts of many different lengths are available, it is also possible to purchase coated abrasives in rolls and to make up endless belts as needed. Abrasive belt splicers are available which will join any size and kind of abrasive belt, or sleeve.

Splicing dies for abrasive belts are also available. These make the cut simultaneously on both ends of a belt. The cut is in the form of interlocking fingers. When joining the belt, a piece of strong, light-weight cloth is cemented over the splice on the back.

Aluminum oxide is the abrasive chiefly used in the metalworking industry. This type of abrasive lends itself for all operations. Finish-

ing of sheet steel, heavy stock removal, breaking and polishing of hole edges, light cleanup of metal surfaces, deburring operations, and weld finishing, all fall within the scope of such abrasives.

Abrasive cloth in different forms, belt paper, heavily-coated cloth discs, crocus cloth, and waterproof cloth, all have their recommended uses. Manufacturers of coated abrasives have also developed special items. Spindle sanders and grinders make use of abrasive-cloth sleeves. Such machines are often convenient where flat edges of work have contours that are to be finish ground. Some of these machines have facilities for tilting the spindle.

Drum sanders are also available, the drum being designed for using coated abrasives in strop form. In one such machine, the drum is made of two halves, locked together by a special locking cone when an arbor nut is tightened. This provides for clamping the ends of abrasive strips.

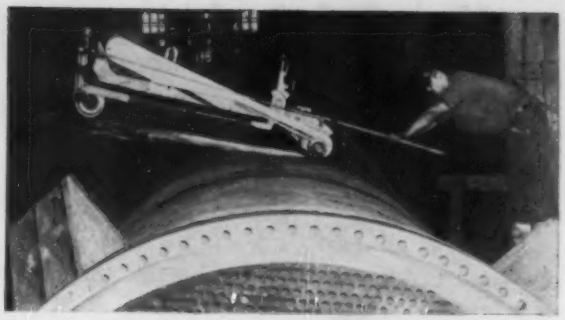
Wide variety of belts, forms

Abrasive cloth manufacturers have developed various special forms generally intended for use on high-speed portable machines. There are spirally-wound abrasive-cloth bands, supported by an additional cloth interlining. There are conically-shaped rolls, designed to fit in and grind varying radii. In some cases, pre-molded discs are used in connection with special rubber pads, for finishing depressions or hollow places in dies.

Another interesting type is a radially-slotted disc, which can be held on a mandrel in a portable electric drill or similar tool. These discs are provided with uniformly-spaced radial slots around their periphery. Their purpose is the burring of both sides of holes. Two discs are mounted back to back on a mandrel. By thrusting them through a hole while they are revolving, then pulling them back again, the slitted edges of the abrasive discs are deflected as they pass through the hole. The discs in each case have a diameter greater than that of the hole. In this way, both sides of holes are quickly burred.

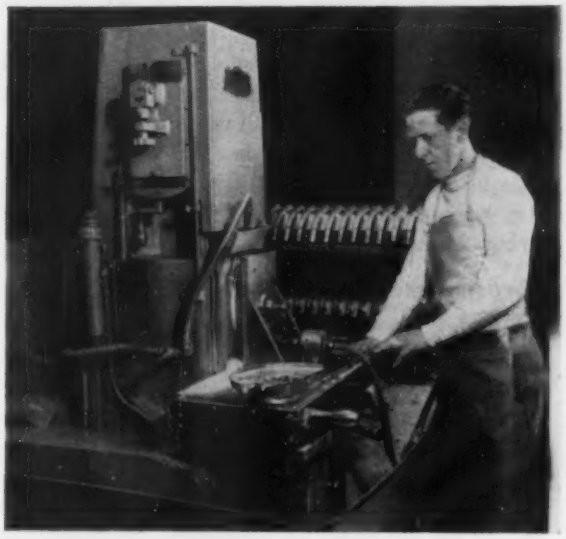
There are special pneumatic sanding drums for use on concave and convex surfaces. These will adapt themselves to any curved surface where nothing more intricate than sweeping curves is involved. When a grinding drum of this kind is lightly inflated, it will adapt itself to a convex surface. Where desired to use such a drum on a concave surface, it is tightly inflated, instead. In many cases, special emery cloth sleeves are used with pneumatic sanding drums for polishing metal parts.

There are other sanding and grinding devices which lend themselves even more fully to the finishing of irregular surfaces and contours.



SWING GRINDER with abrasive belt in use on large fabricated steel tank. Fast-cutting belt operates at 6000 fpm.

BACKSTAND grinding operation finishing cast aluminum housings. Belt resists loading, does more than 300 housings.



BELT GRINDER does job which formerly required milling. Vertical fixture is moved against belt by air cylinder. Production was 37 per hr when milling, 180 per hr by grinding.

One is a special head which makes use of slitted abrasive cloth. The slitted or shredded abrasive is backed up by radial brushes, extending from the periphery of the head. These brushes readily yield to pressure when a surface of irregular contour is brought into contact with the fast revolving head. Thus the tips of the slitted abrasive are automatically pressed into every

"Exceedingly fine finishes may be produced with the finer grits of coated abrasive . . ."

groove and depression in the surface of the work by the brushes.

This type of head is suitable for work applied by hand. It has also been used in automatic and semi-automatic applications. It is designed for finishing applications, not heavy stock removal, and produces a satin finish on the work. One such head incorporates an outer frame which holds replaceable brushes. Inside this outer frame is a special spool, to which is attached coated abrasive strips. Thirty-two separate strips, uniformly spaced, pass between the brushes in the outer frame of the head. Provision is made for bringing the ends of the abrasive strips into proper working position.

Slitted abrasive material may be either aluminum oxide or silicon carbide. It is used dry or in connection with a grease stick. It is available in a wide range of grits. Exceedingly fine finishes may be produced with the finer grits of coated abrasive available.

After the head is mounted on the spindle and the arbor nut is tightened, the machine is started. The face of the head is then raked with the end of a pipe or other piece of scrap material, similar to the manner in which buffing wheels are sometimes dressed down. All internal slack in the slitted abrasive is removed by this raking action plus the influence of centrifugal force. The tips of the slitted abrasive are thus caused to extend somewhat beyond the brush tips.

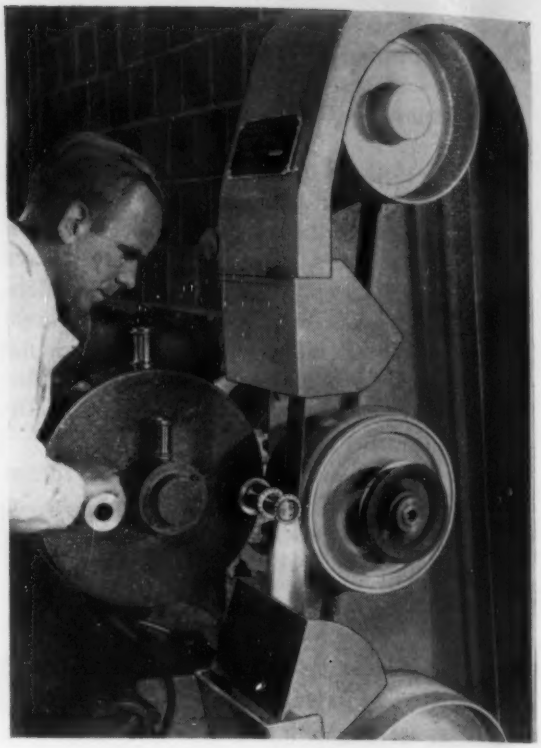
A head of this kind can be used to good advantage in connection with polishing arbors. It has also been used on automatic machines, and on swing frame grinders.

Abrasive sheets on arbor

There is another interesting method of using coated abrasives for getting into and around formed, turned, or irregularly-shaped work. This consists in taking a stack of rectangular abrasive finishing sheets, punched for use on an arbor. This stack may contain anywhere from 25 to 100 sheets, depending on the job. The sheets are set up on the arbor in staggered formation, to form a sort of loose buff.

The general idea is to stagger the sheets so that an approximately equal number of corners will be exposed all around the grinding circle. Accuracy in staggering has nothing to do with balance. Since the sheets are all punched in the center, they will balance on the arbor regardless of their arrangement. Only the corners of the sheets engage the work. In consequence, they find their way into all depressions and grooves.

This method has really been used to a great extent in the woodworking industries, in connection with garnet finishing paper. Garnet abrasive is not suitable for use on metal-working operations but the same idea is readily employed on metal where the proper type of coated abrasive is employed.



POLISHING bicycle wheel spindles on abrasive belt grinder. Contact wheel behind belt is formed to reverse of spindle shape, is not drive wheel so finish lacks chatter marks.

Swing frame grinders are primarily designed for use with solid grinding wheels. They may also be used with special heads employing slitted abrasives, for finishing operations. Special swing frame grinders have been developed which employ a fast-cutting coated-abrasive cloth belt. This belt is usually operated at about 6,000 sfpm, and runs over a special contact wheel.

Abrasive-belt swing frame grinders are employed for weld grinding and tube conditioning jobs, as well as grinding and conditioning of raw metal stock. These combine the speed of the conventional snagging grinder wheel with the smooth finish obtainable by a portable disc sander. This type of grinder is claimed to be from two to four times faster in production than ordinary methods. Abrasive belt changes are very simple.

Since abrasive belt grinding has taken on increasing significance in the metalworking field, various types of machines have been developed particularly for use with such belts. Some of these machines are for removing a considerable amount of material, to grind to a particular dimension, or to grind a flat, round, parallel, or square surface. In other cases, the objective is smooth surface finish.

Special jigs and fixtures may be used with

these machines. A belt grinder may be equipped with a feed table if desired. It is a simple matter to generate small radii, to chamfer or to bevel. Smoothing of excess weld metal is one of the jobs falling readily within the scope of the abrasive belt. In cases where it is desired to grind a surface perfectly flat with an abrasive belt, the machine used has a flat platen behind the belt.

Where a cross-sectional contour of relatively simple form is combined with circular shape, the abrasive belt may be run over a formed pulley, while the work is revolved on a suitable fixture during contact with the belt.

When grinding to specific diameters, usually there is a contact roll behind the belt, and work advance is controlled by holding on centers in a jig and rotating during grinding. However, centerless-type abrasive-belt grinders have also been developed.

Usually, where work is being ground against a platen, more heat is generated, due to friction of the belt against the platen as well as the contact with the work. Therefore, it is common practice to employ a coolant. This calls for coated abrasive of waterproof type. Because abrasive belts incorporate within themselves a slight degree of resilence, abrasive grains on a belt travel over the work more smoothly than abrasive grains in a wheel, and they cut all the way across the work.

Cuts with less pressure, heat

Usually, silicon carbide abrasive is employed for platen grinding, because it will cut with less pressure, and therefore builds up less heat. This material is also more brittle, and consequently keeps itself sharper.

Higher abrasive speeds are employed in contact roll grinding than in platen grinding. Here, where the grinding area is relatively small, aluminum oxide abrasive is more generally used.

On polishing work, a resilent platen is sometimes employed instead of a contact roll or a rigid platen, in order to allow the belt to better conform to the general surface of the work. In some cases a workpiece may be polished directly against an abrasive belt without any support behind it.

In most instances, polishing is performed as a dry operation. Wet-belt grinding has been widely extended in various instances where there are high production demands. Wet abrasive belts are generally employed on machines designed to run the working strand of the belt in a vertical plane.

With a suitable lubricant and a wet belt, it is usually possible to grind to closer tolerances, because loading of the abrasive surface is reduced. Frictional heat is largely eliminated, because the non-working strand of the traveling belt is exposed to air on both sides. Some jobs which formerly called for milling or planing are now being wet-belt ground in far less time.

PRESS FLYWHEEL being ground on abrasive belt machine. Backup wheel is formed to mate with flywheel. Special workholding fixture rotates the flywheel on arbor during grinding.

As a means of still further eliminating heat in the grinding operation, some vertical abrasive belt grinders incorporate a water-cooled platen. On such machines, coolant enters the platen chamber from the bottom, and is discharged under pressure through ports near the top. The downward pull of the abrasive belt then creates a continuous film of coolant between the back of the belt and the entire surface of the platen.

With a small amount of soluble oil in the water coolant, it has been shown that even under heaviest grinding pressure, a reduction in platen temperature results from approximately 150°F with a non-cooled platen to 68°F with a water-cooled platen. In addition, there is a 45 pct reduction in power requirement.

Tilting workholder used

Typical of fixtures for use with belt grinders is a tilting workholder devised for holding a casting 14 in. long having pads on both ends. It is required that faces of both pads be smooth, flat, and in the same plane.

There is a thin section in the casting between the two pads. Therefore care is required to eliminate distortion from clamping pressure. A special tilting fixture was devised, which can be rocked back for unloading and loading the work, then rocked forward by hand lever for the grinding operation. The finished surfaces are flat and smooth. No lapping is required.

A reciprocating table is available for use with some belt grinders. Where work is relatively heavy, and high production is required, this table is arranged to reciprocate by power. The table travels on ball bearing ways, and is driven by V-belt from a small motor. The reciprocating stroke on the table is adjustable from 0 to 8 in.

War baby grows up—

WASH PRIMER

Helps industry fight corrosion

By R. A. Garling
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Vorac Co.
Rutherford, N. J.

Cutting the country's $8 billion (1950) annual corrosion bill is a No. 1 headache for the metalworking industry. Helping, is wash primer, a vinyl resin prime coat developed in World War II to keep ships in the water longer without rusting or fouling, and rapidly gaining acceptance for metal finishing operations. It combines the most desirable properties of a phosphate metal preparation and zinc chromate primer. Wash primer inhibits corrosion and spread of corrosion at the metal-coating interface. It properly wets the metal surface and has excellent adherence when dry. It provides a suitable surface for bonding subsequent coats. Applied by conventional painting methods—with special formulations for dipping—wash primer gives good coverage, dries fast.

Wash-primer, a war-born development designed to keep ships in the water longer without rusting or fouling, has gained wide acceptance by the metalworking industry in the postwar years. Faced with an $8 billion national corrosion cost during 1950, the elimination of corrosion is of prime concern to both industry and government where metal processing is concerned. The Vinylite resin-based prime coat today is the basis for an increasing number of coating systems for the protection of metals of all kinds.

These new coating materials are often preferable to oil base products in both maintenance painting and product finishing applications, especially where substantial chemical resistance is required. Selection of the right coating system for a particular metal surface lies in understanding the function of each component of the system.

Wash primer, Vorac H-400 (Mil-P-15328), produced by the Vorac Co. is a metal conditioner possessing high adhesion and excellent anti-corrosion characteristics which can be used in combination with a variety of topcoatings and, with minor variations, on most metal surfaces.

A coating system is a series of coatings applied to build a supported film laminate. Each coat, Fig. 1, has a function in protecting or decorating the metal. Topcoat life depends mainly on durability or integrity of the prime coat. A metal primer should:

1—Properly wet the metal surface and adhere when dry.

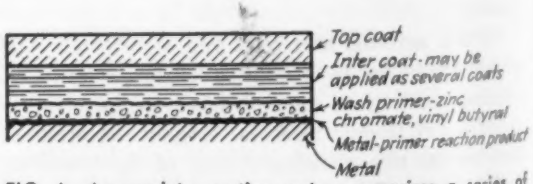
Top coat
Inter coat - may be applied as several coats
Wash primer - zinc chromate, vinyl butyral
Metal-primer reaction product
Metal

FIG. 1—A complete coating system comprises a series of coatings properly applied to the metal substratum.

FIG. 2—Vinylite resin marine finish after sea water immersion in Florida. An unexposed panel (1) shows (a) wash primer No. 1, 0.0003 in.; (b) resin VAGH—red lead primer, 0.005 in.; (c) resin VYHH—Cu_2O-resin-anti-fouling coat, 0.010 in. (2) Submerged 14 mon. (3) Submerged 24 mon. (4) Submerged 34 mon. Note there is no corrosion at spots where coating has been removed. Navy found wash primers gave added protection to ships during World War II.

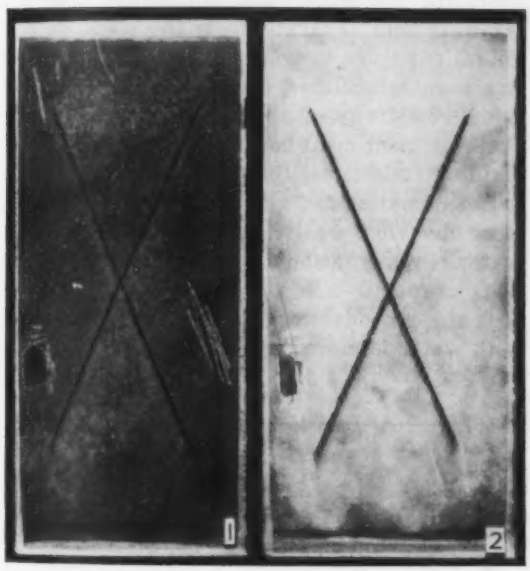

FIG. 3—Effect of wash primer on performance of paints after 90 days' exposure on Florida beach. (1) Alkyd on bare metal. Corrosion has almost destroyed film. (2) Same alkyd over metal treated with wash primer.

2—Inhibit corrosion and spread of corrosion at the metal-coating interface.

3—Provide a suitable surface for bonding subsequent coats.

4—Provide protection during a reasonable exposure period prior to topcoating.

In many systems, intercoats are necessary. The intercoat, often called a surfacer, does not require the decorative characteristics essential to a topcoat, nor the adhesion of the primer. It adds bulk to the system, hides metal defects and provides a sanding surface.

An intercoat also bonds a primer to a suitable topcoat. For example, wash primer is advantageously bonded to a standard vinyl topcoat through a vinyl intercoat, Fig. 2, 3.

Substantial advantages are obtained through use of mica and aluminum pigments, Fig. 4, in decreasing film permeability. If these materials are incorporated in the intercoat, any desired color topcoat may be used. This is of particular advantage in maintenance painting.

Modern topcoating materials must meet critical decorative and functional requirements. Topcoating materials must also be selected to resist breakdown from primary causes of coating failure. Selection will depend on and vary with end use of the finish.

Coating failure, generally associated with the topcoat, involves a breakdown of the entire

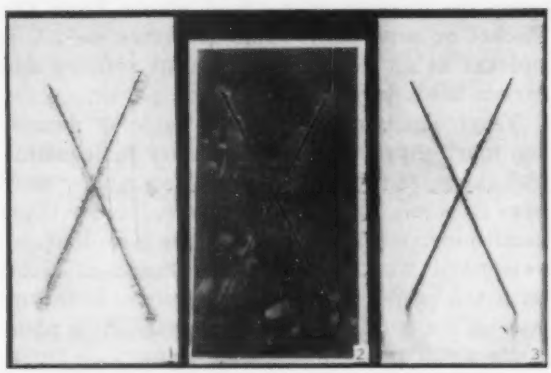

FIG. 4—Comparison of pigments in Vinylite resin VAGH air-dry coating over WP-1, exposed 45° South on Florida beach for 6 mon. (1) Rutile titanium dioxide. (2) Red lead. (3) Aluminum powder. Pigments decrease film permeability.

"A complex reaction . . . is responsible for its outstanding bonding properties . . ."

coating system. Important causes of film failure include:

1—Chemical breakdown due to water, chemicals, sunlight, heat, or combinations of these.

2—Physical breakdown by abrasion, erosion, or severe stresses imposed by expansion and contraction under service conditions.

3—Lack of film flexibility.

4—Incomplete coverage.

5—Inadequate metal surface preparation.[1]

6—Use of primers which do not completely conform to requirements of a primer.

Wash primer was designed by Bakelite Corp. to provide the U. S. Navy with an improved primer for ship painting. This material known as WP-1 is still the standard in industry.

Two typical wash primer formulations, Table I, are prepared by pebble mill grinding the base and adding the acid diluent to the base grind. These formulations represent systems based on zinc chromate and lead chromate. It is important to use grades containing a minimum amount of water soluble materials. It is important that the ratio of resin-pigment-phosphoric added be kept constant though more solvent may be added to the acid diluent to reduce viscosity and change the ratio of diluent to base.

Several solvents are available. Denatured alcohol and butanol may be used and dilution with ketones or aromatic hydrocarbons will reduce the viscosity of WP-1 formulation. Aromatic hydrocarbons should not be used in XE 5220 because they affect stability.

Water content critical

Under conditions of high humidity or for applications to damp surfaces, thinner should contain approximately 25 pct butanol. Water content of vinyl butyral resin solutions, especially wash primer, is quite critical. Approximately 5 pct water should be present in the complete mixture introduced either from the alcohol or separately. Talc or Asvestine 3X is present as an extender to prevent settling and carbon black will increase hiding power.

Vinyl copolymers as paint vehicles possess the inert characteristics necessary for continuous exposure to salt water. However, they were poor in retaining adhesion to metal under these conditions. Wash primer was the result of development work aimed at finding a material with the proper degree of adherence. It encompassed the most desirable properties of a phosphate metal and zinc chromate primers.

An air-dried coating system is no better than the primer employed. Under practical application conditions there are no air-dried coatings available which completely prevent moisture vapor transmission. Moisture can reach the metal beneath the coating by unavoidable breaks in the coating, by osmotic pressure, and by electroendosmosis.[2] Heavy applications of various plastic topcoats reduce these factors to negligible proportions but are costly. The important fact is that moisture does penetrate even highly impermeable materials when applied as coatings at a thickness justified by coating economics. It is therefore essential that the primer inhibit corrosion and the spread of corrosion at moisture penetration points.

The most common type of wash primer now in use is composed of a vinyl butyral vehicle with a special zinc chromate pigment of limited water solubility. Phosphoric acid is dissolved in exact proportions in an alcohol thinner, and serves as a reactant when the primer is thinned.

A complex reaction between resin, pigment, phosphoric acid and the base metal to which the primer is applied, is responsible for its outstanding bonding properties. Wash primer is packaged and sold as a two-component material which must be mixed immediately prior to use and remains stable 8 to 24 hr after mixing.

Most conventional zinc chromate primers are resistant to water but ultimately lose film strength and separate from the metal on continual exposure to water present in the film. It has been established by measurements on electrical resistivity of film-forming resins that the resin-pigment combination used in wash primer maintains electrical resistivity in water, Fig. 5.

Resin coatings of vinyl butyral on steel maintain electrical resistance[3] when immersed in water. Pigmentation in each case, Fig. 5, was ZTO chromate—25 pct pigment volume. Note that the physical condition of a film saturated with water is more important than initial mois-

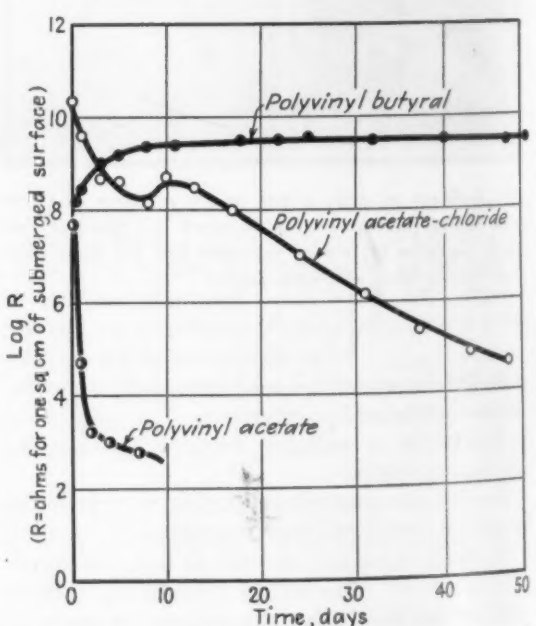

FIG. 5—Polyvinal butyral coating, measured for electrical resistance, was in excellent condition after 6 mon in water.

ture absorption.[4] A definite amount of resin swelling can occur without decreasing film strength. This water absorption, accompanied by swelling, exerts an equalizing pressure toward the surface of the coating system. Thus a continually immersed coating system, primed with wash primer, may reach a state of equilibrium with regard to the degree to which water can penetrate.

Iron phosphate film formed

Another factor contributing to the success of wash primer is the type of bond formed with metal. If steel is treated with dilute phosphoric acid solution, a protective film of iron phosphate forms. An interface exists between this phosphated surface and any subsequent film applied. This phosphating action is combined with the priming operation. A continuous interface between the phosphated surface (inorganic) and the primer surface (organic) is eliminated. Where wash primer failure has been carefully observed, bond failure generally begins between the primer and topcoat and not at the metal.

Wash primer is applied by any conventional method, other than dipping. Stable formulations are available for dipping applications but are not recommended for general purpose use on all metals. Use should be checked in each case.

Wash primer is usually applied, Fig. 6, in thin films. Coverage will depend on the smoothness of the metal surface. This material will penetrate and not bridge irregularities in the metal and somewhat different application technique is required. Normally painters and finishers attempt to obtain complete film hiding with each coat. With wash primer this is not necessary and is wasteful of material. The only requirement is that the metal surface be completely wetted by the primer. With suction spray equipment it may be necessary to further thin ready-to-apply material to obtain wetting.

Theoretical coverage based on no loss will vary from 250 to 300 sq ft per gal, as for example, brushing on smooth metal surface. The amount of dry film required will vary between 0.3 to 0.5 mils depending on the anti-corrosion requirements of the coating system. When used with an additional chromate primer, less is required. If applied at under 0.3 mils, topcoating should not be delayed.

Wash primer effectiveness is governed by:

1—Phosphoric acid contained in the mixed product must be free to react on the metal. Porous rust, oil, loosely adherent mill scale, and previously phosphated surfaces may affect a limited degree of mechanical bonding, but they are not suitable for the necessary chemical bond to the base metal.

2—Topcoat must adhere to the primer or a suitable tie-coat be used.

3—Where the coating system is used to protect metal from chemicals, Fig. 7, which have an active corrosive effect on the metal, local points of breakdown may be expected. These are due to flaws in application and must be touched-up as they occur. The topcoat must be completely inert to the chemical in question.

Investment in coating system

Many types of topcoating, see box, may be used directly over wash primer. Specific products should be tested with wash primer. If adherence is equivalent to that of the coating system when used without wash primer, inclusion in the system may prove advantageous.[5]

Costwise wash primer should be considered as an investment in a coating system. It seldom should be used to replace any coating material in the system. In many instances, however, it can replace phosphating treatments. It also saves by cutting down application costs in repainting. If a conventional coating system has a useful life of 1 yr before repainting is necessary, wash primer can more than double this useful life. In maintenance painting, application costs and costs of metal cleaning prior to application are far in excess of actual paint cost. Wash primer is recommended to improve present systems.

Wash primer dries in 15 to 30 min for recoating, and the special vinyl topcoats are ideally

FIG. 6—Spraying on wash primer is simple operation. Normal spray equipment is being used on these electronic parts.

TWO TYPICAL WASH PRIMERS

	WP-1 Parts by Weight	XE-5220 Parts by Weight
Base Grind		
Vinylite resin XYHL	7.2	9.0
Zinc tetroxy chromate or basic zinc chromate pigment*	6.9	....
Lead chromate (low in soluble salts)**	....	8.6
Talc (asbestine 3X)	1.1	1.4
Isopropanol, 99 pct	50.4	53.0
Toluene	14.4	....
Methyl isobutyl ketone	....	13.0
	80.0	85.0
Acid Diluent		
Phosphoric acid, 85 pct	3.4	2.9
Water	3.4	2.9
Isopropanol, 99 pct	13.2	9.2
	20.0	15.0
	100.0	100.0

* Mineral Pigment Corp. M1828 or Imperial Paper & Color Co. #2259.
** Imperial Paper & Color Co. A-548.

"Prime coated sheet (aluminum) can be used . . . where drawing, forming . . . is required . . ."

suited when rapid dry is important. Sandblasting and prime coating can be a continuous operation. Scaffolding need not be moved, plant operations are not disrupted. Equipment can be put into use as soon as the painting is complete.

Most outstanding results were first obtained in marine applications, Fig. 8, but in recent years uses for wash primer have been extended to the industrial and maintenance fields with great success, Figs. 9, 10. They are extensively used in the petroleum industry as coatings for pipe lines, oil storage tanks, and drilling platforms. Other applications include air conditioning equipment, particularly fans, Fig. 11, where corrosion on the edge of fan blades is very severe. The wash primer provides a tight, adherent bonding surface and the vinyl resin topcoating provides wear, abrasion and corrosion resistance.

Development of wash primers permits application of house paints to aluminum metal surfaces. Aluminum sheets, Fig. 12, can now be obtained which have a shop-applied wash primer on the flat sheet. This prime-coated sheet can be used for making of any production item where painted or coated finishes are used and where drawing, forming, or stretch-forming is required.

FIG. 8—Ship's rudder was coated on left with common paint system, and on right with system based on wash primer. After 2 yr, ordinary paint system requires full refinishing.

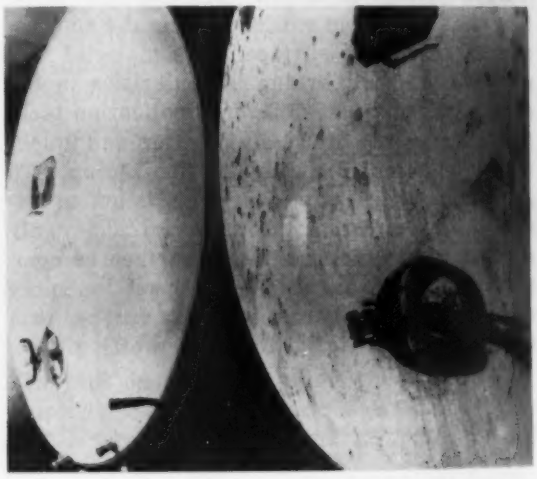

FIG. 9—Beer storage tanks kept at 32° to 34° F in damp atmosphere show effects of different paint systems. Tank at left has wash primer coating.

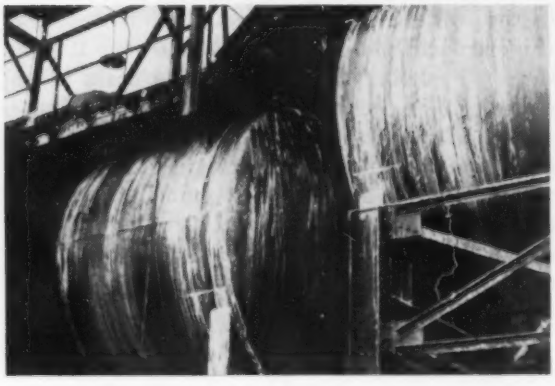

FIG. 7—Sulfuric acid tank is maintained at 90° to 100° F. After 1 yr service considerable spillage is shown but coating based on wash primer and metal are unharmed.

TOPCOATS WORK WITH WASH PRIMER

1—Oil-based paints.

2—Styrinated oil and alkyd paints and enamels.

3—Rubber base coatings.

4—Specialized vinyl coatings.

5—Lacquer formulated for specific metal adherence.

6—Baking enamels and synthetics.

7—Most emulsion paints which are generally recommended only on porous non-metal surfaces.

Mayer Refrigerating Engineers, Inc., of Rutherford, N. J., refrigeration manufacturer, is using wash primer on chiller units. The primer is applied to galvanized iron or steel and replaces the phosphate wash formerly used—a system seriously objected to by the workers. Topcoat is a decorative machinery enamel.

Levco Metal Finishing Co. of Long Island City uses this material on electronic parts for aircraft. A wrought iron stand produced by this

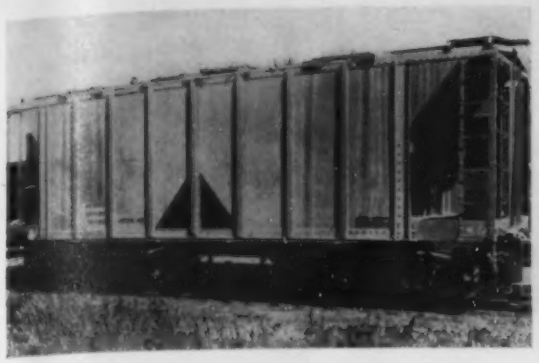

FIG. 10—Finishes based on wash primer on freight cars handling alkalies and other corrosive chemicals last up to six times as long as ordinary paint systems.

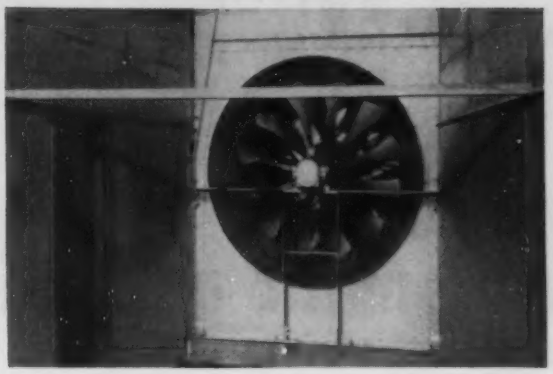

FIG. 11—Air conditioning fan in textile mill was effectively treated with wash primer, to prevent corrosion.

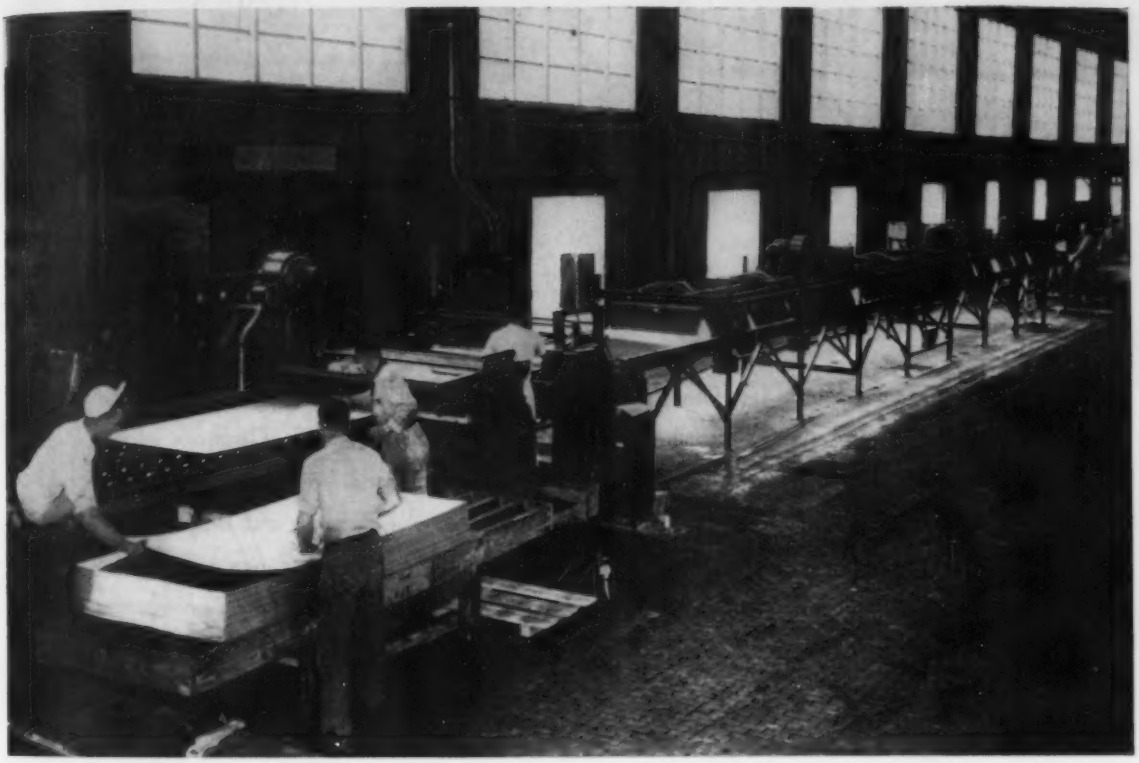

FIG. 12—Aluminum sheet is treated with wash primer above. Coating is being applied at machine at left.

company offers an excellent example of the corrosion inhibiting qualities of this primer. Before the wash primer system was adopted, stands were sprayed as each order was placed.

At the time of spraying, they had to be decreased and steel-wooled. A flat black paint was then applied and the article was ready for marketing. With this old system, outdoor life service of the finished product was greatly limited due to fast corrosion. Experimentation with the wash primer base proved this coating was very effective in decreasing rejects, improving service life and eliminating almost 2/3 of the time necessary to produce the finished product. By dipping the stands as received in a wash primer solution and then stacking them, the degreasing and steel-wool steps in the operation were eliminated, a saving 2½ to 3½ min per stand.

Recently, a metal chair manufacturer received an order for aluminum chairs sprayed with a Vinylite resin-base wash primer. Prior to this order, chairs had been anodized. A production line was set up for application and drying of wash primer. Today, the company has found that wash primer is suitable for almost all of its metal coating work.

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More work in less space—

Automatic acid bright dip HAS MANY ADVANTAGES

By K. W. Bennett
Chicago Editor

Higher unit output in less floor space has been attained with a fully automatic acid bright dip processing unit set up at Bastian-Blessing Co., Chicago. Capacity of the Stevens Machine is 1 ton of small brass parts per hr. Inconel baskets are hung from traveling arms that lower and agitate each basket in the cleaning and dipping solutions. Total length of the automatic dipping line is 37 ft 6 in. Two men operate the unit. Acid fumes are carried off by a push-pull air duct system and given an alkaline wash. Liquid acid wastes are carried off below floors in vitrified tile ducts. A central lubrication system serves the entire machine. A centrally operated control board permits the dwell period at any station to be set to a fraction of a second.

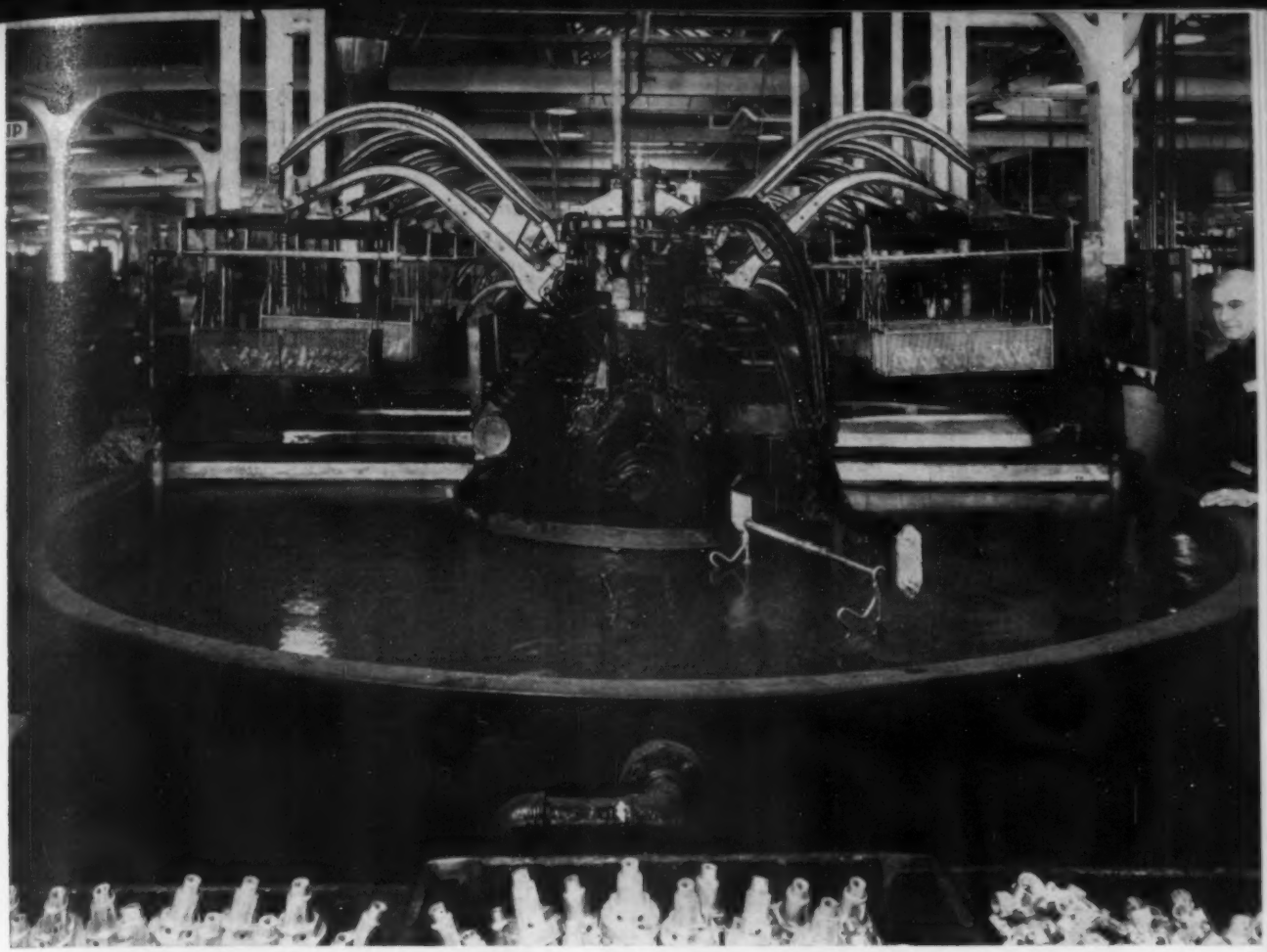
Bright dip has always offered the manufacturer a knotty problem in unit output and floor planning. The continuous bright dip machine built by Frederic B. Stevens, Inc., Detroit, for Bastian-Blessing Co., Chicago, seems to solve some of these problems.

With a capacity of 1 ton per hr, the Stevens bright dip machine is fully automatic in its cleaning of small brass parts, including double cleaning, rinse, acid pickle for scale removal, rinse, bright dip, rinse, chromate treatment, rinse, and hot rinse. With minor changes the machine could dry the parts following treatment.

Inconel baskets with a carrying capacity of 35 lb offer a capacity of 72 loads per hr. These are hung from traveling arms that lower and agitate each basket in the cleaning and dipping solutions. Total length of the automatic dipping line has been cut to 37 ft 6 in. by doubling the line back, and by placing the narrow width of the dip tanks at right angles to the line of travel of the loaded baskets.

Two men operate the Bastian-Blessing installation, and replace a line of five to eight hand operators. The resultant saving in manpower allows the Chicago firm to supply additional manpower for hand dipping operations, which are still necessary in high tolerance parts. For instance, a high tolerance external valve seat, which might be scratched in an automatic operation, is hand dipped.

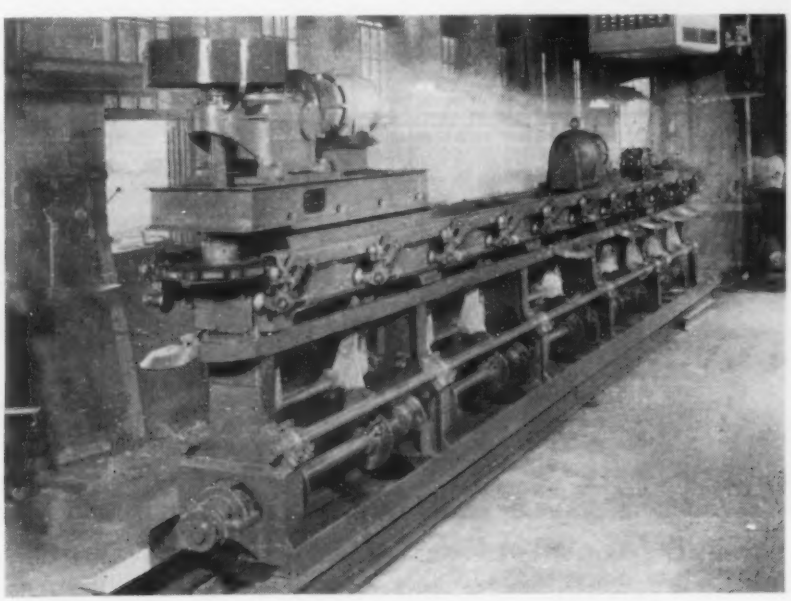
Allowed loading time for the 12 x 12 x 30 in., 25 lb baskets is 80 sec. The machine's period of rest at each station is 40 sec, but an electro-mechanical timing mechanism allows tank immersion time to be cut as low as 5 or 6 sec.



ONLY TWO MEN are needed to operate fully automatic bright dip machine at Bastian-Blessing Co., plant, Chicago.

A breakdown of the time at each station with the width of the tank along the line of travel is shown in the accompanying table.

After cleaning, pickle and rinse, the loaded basket pauses for 34 sec before immersion in the acid bright dip. This allows full drainage of any water that would dilute the bright dip solution. A pause over the tank after dipping insures good drainage of the bright dip back into its own tank. Bastian-Blessing engineers claim the resulting saving in acid is extremely high. Similarly, the banging of carriers that often accompanies hand dipping has been eliminated



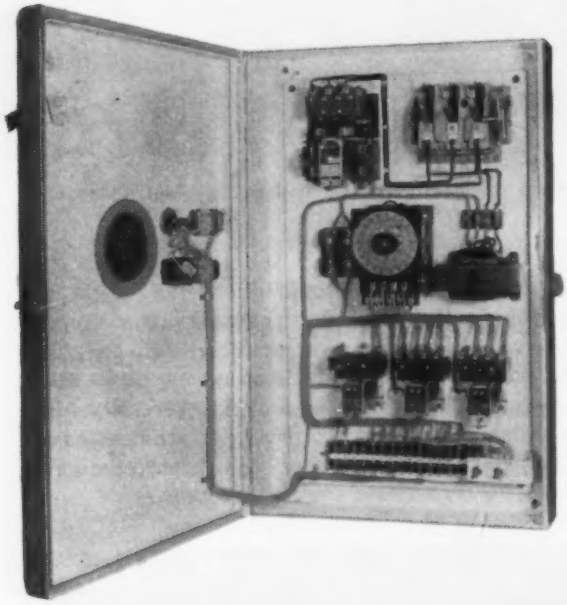
HEART OF bright dip unit is machine built by Frederic B. Stevens, Inc., Detroit. Hydraulic coupling drive is used.

"Cleanliness, safety of operation, a fairly high output, good product uniformity . . ."

BREAKDOWN OF ACID BRIGHT DIP OPERATIONS

Oper. No.	Operation	Bath	Tank Length in in.	Time in sec	Tank Lining
1	Heavy duty cleaner	Alkaline	60	90	.....
2	Soak cleaner	Alkaline	60	90	.....
3	Rinse, spray	Hot water	40	40	.....
4	Acid pickle	½ HCl, ½ H_2O	60	90	Rubber
5	Rinse, spray	.....	30	40	Rubber
6	Acid bright dip	Acid[3]	30	12[3]	.....
7	Rinse, spray	.....	30	40	Koroseal
8	Cold rinse	.....	444[4]	90	Koroseal
9	Dichromate dip	.....	30	40	Koroseal
10	Rinse, spray	.....	30	40	Koroseal
11	Rinse, spray	.....	30	40	.....
12	Hot water rinse	.....	60	90	Lead
13	Drying	.....	120 in. machine travel	160	.....
14	Load, unload	.....	.....	80	.....

[1] Extended drain, 34 sec, prevents dilution of acid bright dip.
[2] Standard solution: 2 gal H_2SO_4, 1 gal nitric acid, 5 oz HCl, 1 qt H_2O.
[3] Total time before rinsing. Immersion time 6 sec.
[4] Semi-circular tank.



and each basket enjoys considerably longer life.

Acid fumes are carried off by a push-pull air duct system, and are subjected to an alkaline wash. Liquid acid wastes are carried beneath the floor in vitrified tile ducts. As a result, floor space in the area of the machine is clean, dry.

At the operator-loader's station are controls for the entire machine, and a central lubrication system that will service the entire machine.

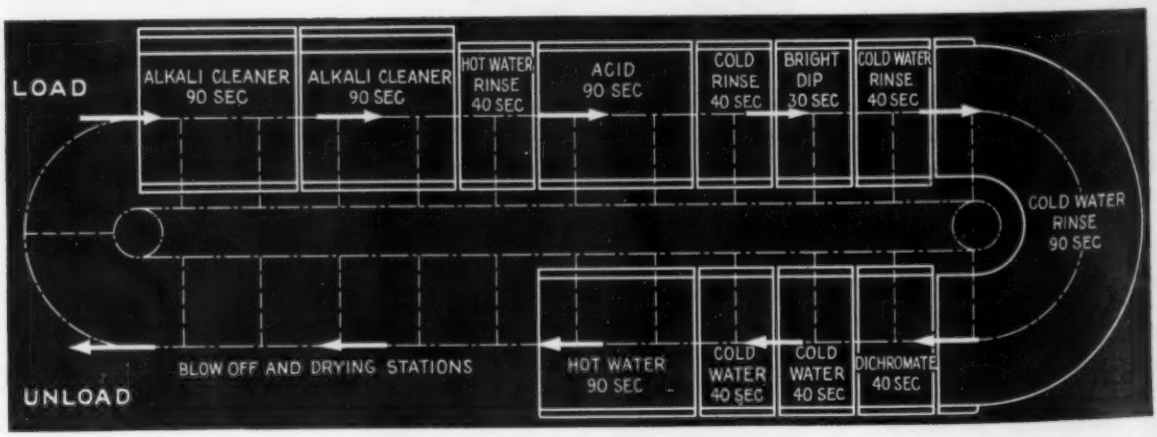
Company engineers believe the machine's output can be increased. An alternate type basket which allows automatic bright dipping of cup-shaped items is being designed. This had not been attempted with the standard basket because of the loss of acid trapped in deeply recessed pieces after dipping.

The Stevens machine allows for cleanliness, safety of operation, a fairly high output, good product uniformity, and savings in manpower and costly acids. Bastian-Blessing has found it necessary to maintain a hand dipping department as well, however, to handle very heavy work, parts with externally located high tolerance fittings, and parts that might trap quantities of acid.

A mechanical agitator provides an up-down motion, similar to vigorous dunking by hand operation. This produces a positive slushing action throughout the mass of work in all tanks. Full depth weir-type sumps with riffle pipes in the alkaline cleaning tanks provide a cross-flow circulation and skimming action to keep bath surface clean. Water for rinse tanks enters through vacuum breaker at the tank bottom to assure uniform elimination of sludge.

The centrally located control board allows the operator to set the dwell period at any station, by means of an auxiliary timer, to within fractions of a second. Provisions are made to skip any individual tank or series of tanks as the operator desires, so that the machine could be used as a cleaning machine on one basket and a bright dip machine on the next basket.

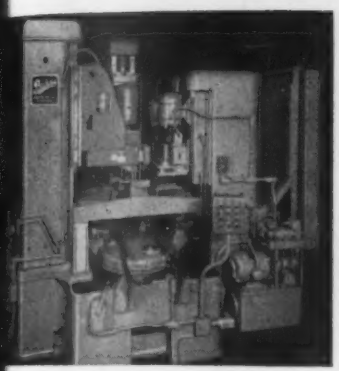
CONTROL PANEL permits operator to set dwell period at any station to within fraction of a second.



SCHEMATIC LAYOUT of automatic bright dip unit. Parts, loaded in baskets swung from rocking arms, move from loading area through tanks, into drying area and finally back to unloading position. Travel length is 37 ft 6 in.

NEW equipment

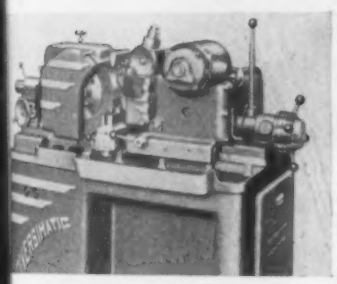
New and improved production ideas, equipment, services and methods described here offer production economies . . . fill in and mail postcard on page 115 or 116.



Special machine speeds super charger production

A special machine now at work in the manufacture of super chargers for AF planes consists of a main base, to which are mounted four vertical hydraulic drill units, a single-part holding fixture, and a 36-in. diam 10-station index table and a central coolant system. For tool safety, the machine is built so that No. 2 unit must complete a work cycle followed by one index, before No. 3 unit can function. Special control equipment guarantees a complete work cycle by both the No. 2 and No. 3 units before No. 4 unit can begin. Two complete revolutions of the index table are required to complete one part, and all of the machine's moving parts are automatically lubricated. *Buhr Machine Tool Co.*

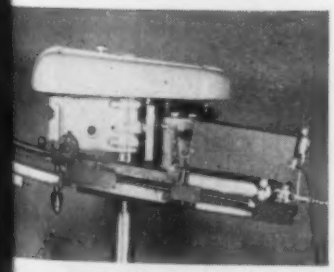
For more data circle No. 16 on postcard, p. 115



Centerless grinder handles 1½-in. stock diameters

Greater capacity and superior design feature the new model No. 1-R centerless grinder. Due to its increased ruggedness and capacity, the machine is recommended for operation with 5 hp motors only. Massive grinding wheel spindle supported by super-precision roller and ball bearings combine to produce a cool running spindle. Tolerance of 0.0002 in., or better, is guaranteed and the machine is said to be equally proficient in grinding steel, nonferrous metals, glass, brass, plastics. *Diversified Metal Products Co.*

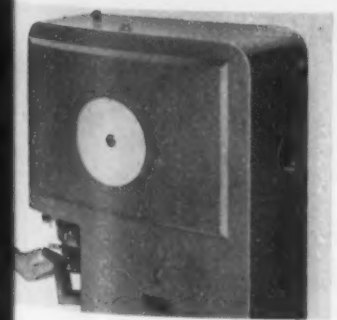
For more data circle No. 17 on postcard, p. 115



Drill press feed "feels" its way through work

The Sensitorque drill press feed is a new approach to the problems of drill breakage which are encountered in deep hole drilling. The device does not depend upon predetermined timing cycles for its operation. If drill becomes clogged with chips, runs dry of coolant, hits a blow hole or seizes in anyway, an electrical impulse is instantaneously sent to the drill press feed which withdraws the drill and returns it to working position. *Bellows Co.*

For more data circle No. 18 on postcard, p. 115

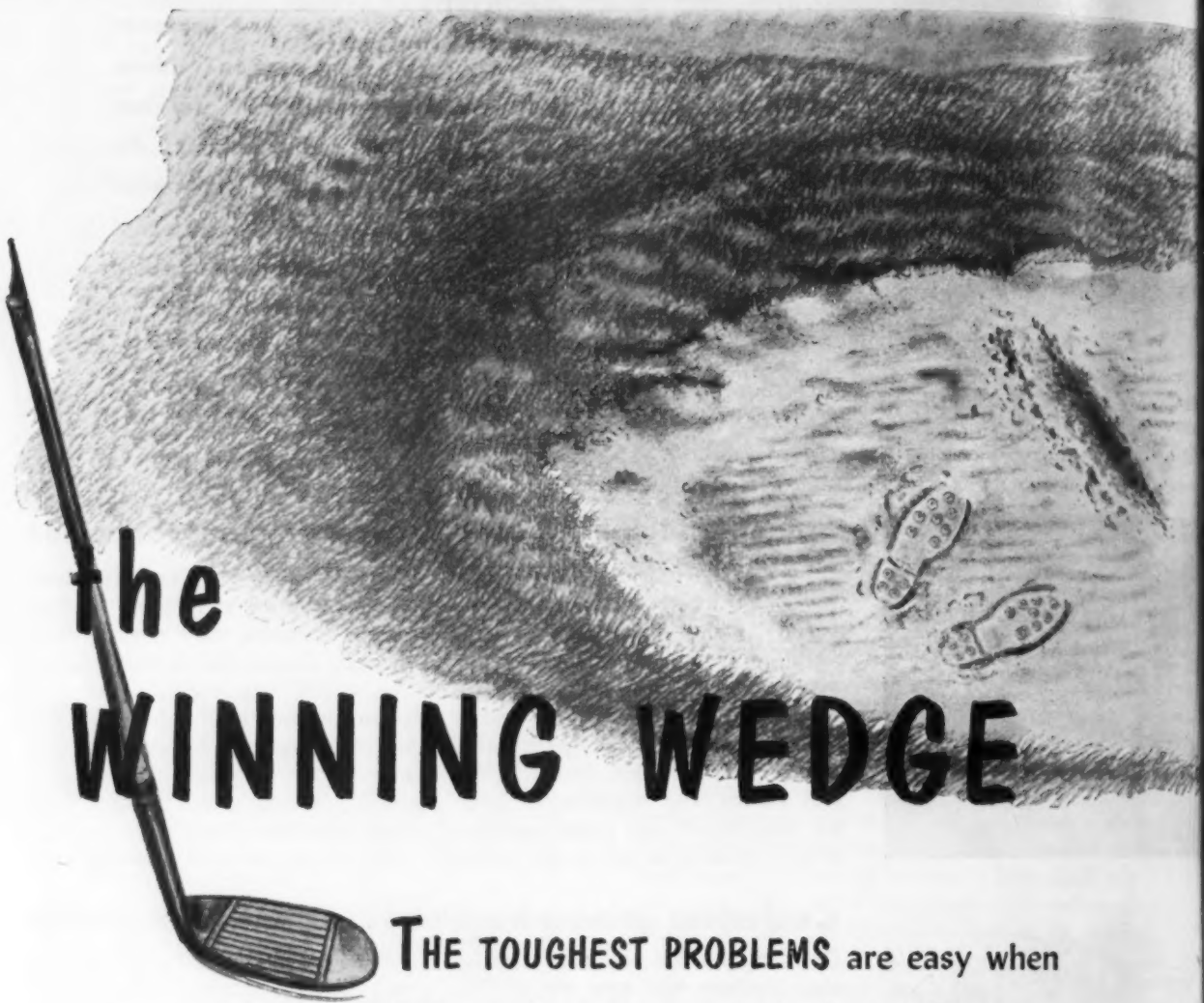


Direct moisture determination in 30 seconds

Moisture in foundry sand and a wide variety of granular or fibrous materials can be determined, by direct drying and weighing, in 30 sec. The sample is dried in 10 to 15 sec using a fast-moving stream of thermostatically controlled hot air. Any size sample from 10 to 35 g is automatically weighed by a built-in electronic balance, which also indicates the moisture loss in percentage after drying without any balancing operation. The new device is known as the No. 279 Quickmoisture, developed by *Harry W. Dietert Co.*

For more data circle No. 19 on postcard, p. 115

Turn Page



the WINNING WEDGE

THE TOUGHEST PROBLEMS are easy when proper knowledge and experience get in there and pitch. Tubing problems, too, are best solved by experts—professionals in their own right. Penn Brass & Copper Company, well-known for *quality tubing* for over a quarter of a century, has the technical facilities and deep-reaching experience to help you choose the *right* tubing for your needs. Precision drawn and annealed to strict specifications, Penn seamless tubing is always clean, bright, and uniform in wall thickness. Insist on PENN—the tubing *unmatched for quality.*

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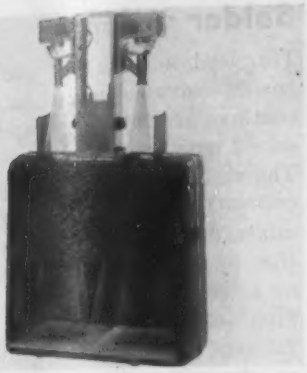
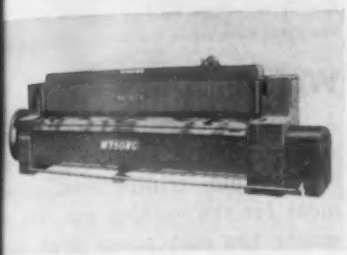


Surface study by comparison projection

Greater flexibility in use and increased portability are features of the new Faxfilm surface comparator. Faxfilm is the method of surface study in which a clear plastic replica of a surface is made in about 1 min and projected in a microprojector to show minute details of surface condition with marked three-dimensional effect. The instrument provides comparison projection of two Faxfilm replicas at 30 diam magnification. Principle uses are for surface roughness inspection, in machinability studies, and changes in wear and life tests. One projector may be removed from the large unit and carried in a small case, when comparison projection is not required. *Brush Development Co.*

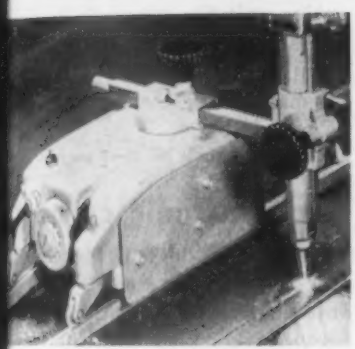
For more data circle No. 20 on postcard, p. 115



New 1/4-in. series of squaring shears introduced

Construction of a new ¼-in. series of power squaring shears with 4, 6, 8, and 10-ft cutting lengths is from massive Hi-tensile castings. Back gage is ball-bearing, precision, adjustable to 0.0078 in. by front operated handwheel. Holddown action is by roller and cam action. Individual compression springs in each holddown foot compensate for varying thicknesses in metal being sheared. Clutch is jaw-type. *Wysong & Miles Co.*

For more data circle No. 21 on postcard, p. 115



Machine carriage aids metal cutting, welding

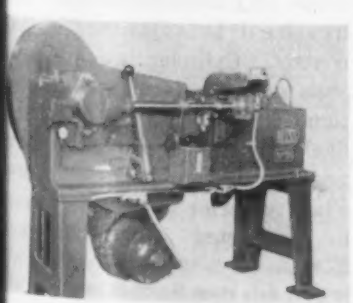
A low-cost, lightweight machine carriage is designed for straight-line, bevel, and circle-cutting of metals, many welding and flame-treating jobs. The Oxweld CM-45 weighs 33¼ lb complete with blowpipe, so it can be moved easily from one job to another. Compactness makes it convenient for use in close quarters. It is housed in a sturdy, one-piece aluminum casting and is powered by a heavy-duty electrically reversible motor. A centrifugal governor covers a stepless speed range of 4 to 32 ipm. All controls are grouped together at the rear of the machine. Starting, stopping, and reversing can be handled by a single control when the clutch is engaged. *Linde Air Products Co.*

For more data circle No. 22 on postcard, p. 115

Motorized turntable provides 6 to 48 positions

For use in production work, a motorized turntable can be supplied with 6 to 48 positions. Index speed can be adjusted with the combination of timer and adjustable speed pulley from a few seconds to several minutes intervals. An additional foot switch can control the index time for any desired length of operating period. Work spindles are either rotating or stationary. All driving parts, geneva index mechanism, speed reducer, motor and solenoid operated clutch are located underneath the table. In front and side of the machine the electrical equipment, motor starter, relay, timer are conveniently located. Table is used for soldering, brazing, welding, etc., operations. *Eisler Engineering Co., Inc.*

For more data circle No. 23 on postcard, p. 115



Press for piercing 20 mm cartridge cases

Horizontal piercing press has been developed specifically for piercing the flash hole on brass or steel 20 mm cartridge cases. This 5-ton capacity press pierces the hole in one case per stroke and operates at 60 strokes per min. It is equipped with a hand-filled chute feed with three stations. First station is a detector to check the position of the case in the chute, the second is the work station and the third is a detector to check the correct piercing. *E. W. Bliss Co.*

For more data circle No. 24 on postcard, p. 115
Turn Page

Can YOU Do This?

• Do your slings give maximum safety in handling the 101 odd loads that your crane moves daily? A combination of ACCO *Registered* Wire Rope Slings, as shown above, can be used safely because all fittings and attachments have full rope strength.

The DUALOC Ending produces the strongest wire rope sling made. Two collars insure uniform strength from sling to sling. Actual strength certified by warranty certificate. Preformed improved plow steel Green Strand wire rope with steel core assures maximum resistance to kinking.

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AMERICAN CHAIN & CABLE

TRADE MARK

Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

ACCO Registered DUALOC Slings

Solder stripper

Tin, lead and tin-lead electro de posits, heavy solder and hot dipped coatings are said to be rapidly dis solved with a new alkaline chemical The material is used in water in concentration of 1 lb/gal, and th mixture is heated to 160° to 180° F Due to its alkaline nature there i no attack upon base metals. Strip ping action on both tin and lead i fast and thicknesses of 0.005 - 0.01 in. are said to be removed in 1 h *Enthone, Inc.*

For more data circle No. 25 on postcard, p. 1

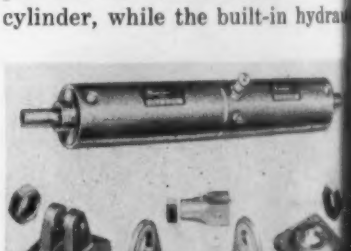
Welding gantry

A specially designed gantry fo semi-automatic welding units fea tures rapid, tridirectional adjust ment for the welding gun. The op erator has easy access to all weld ing machine controls because th entire unit fits compactly on a cas ter stand. Circumferential weld from minimum to 54 in. diam ca be made with the standard rack *Hillco, Inc.*

For more data circle No. 26 on postcard, p. 1

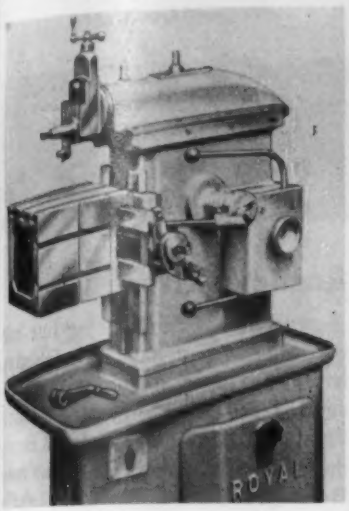
Air hydraulic cylinder

New air hydraulic cylinder is avai able in two bore sizes, 2- and 3-in Interchangeable mounting bracket provide complete versatility o mounting. Standard shop airlin pressure is utilized to actuate th cylinder, while the built-in hydra



lic system furnishes positive regu lation of forward or reverse stro movement by adjustment of spee control. Cylinder is for powerin tools or work in machining opera tions to permit rapid travers finely controlled movement durin work operation, and fast revers Flush exterior permits installati in restricted space. *Moderna Corp.*

For more data circle No. 27 on postcard, p. 11



Shaping machine

Among the advantages claimed for the new Royal 10-in. stroke shaping machine are compactness and ability to spare larger machines for larger jobs, low power consumption, and large metal removal rate. Its swiveling box table has three T slots in the top face and in one side has two horizontal T slots and a vertical V groove for holding round bars. The toolhead swivels through 120°. Power feeds to the table both transversely and vertically. Motor is three-phase 60 cycle, 200 v. *Hall Tool Co.*

For more data circle No. 28 on postcard, p. 115

New bushing for sheave

NewMagic-Grip bushing for A-C's stationary-control, wide-range Vari-Pitch sheave has been announced. The bushing makes possible quick and easy installation or removal of the sheave and permits mounting it on the shaft so that the adjusting control mechanism is either toward the motor bearing or away from it. *Allis-Chalmers Mfg. Co.*

For more data circle No. 29 on postcard, p. 115

Plumber's furnace

A new propane-butane plumber's furnace is a combination floor and tank top model. It is lightweight for portability, rugged enough for heaviest jobs. The furnace is positive control type. Can be adjusted from a low, warming heat to a high heat of 65,000 Btu. *Weldit, Inc.*

For more data circle No. 30 on postcard, p. 115

Turn Page

an ACCO product
ACCO REGISTERED SLING CHAIN
REACH 10 FT. 6 IN.
SER. NO. G 6 3 2
a Sign of Safety
• The identification ring you find on every ACCO Registered Sling Chain is your sign of safety. It's your guarantee of quality. It makes it easy for you to select the correct . . . safe . . . sling for each lift.
You can get ACCO Registered Sling Chains in the type, material, and size best suited for your work. No better sling chains are made. See your AMERICAN CHAIN distributor or write for Catalog DH-314.
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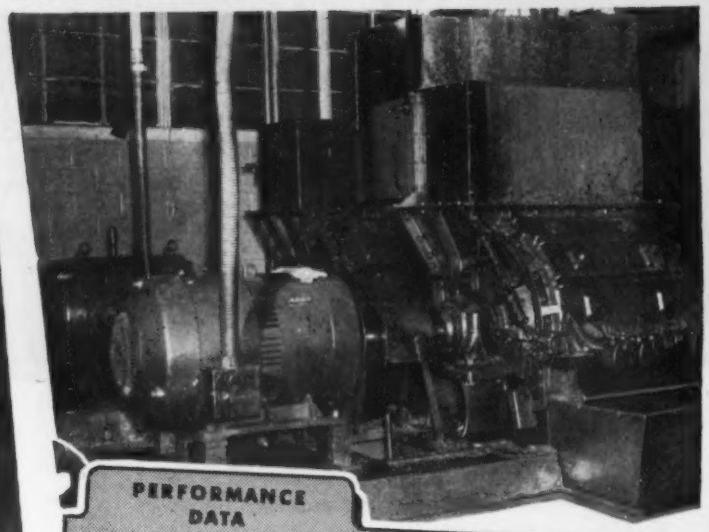
More "CRUSHING" FACTS ON American CRUSHER PERFORMANCE

Case History No. 15

$60,000 ANNUAL GROSS PROFITS! WITH TWO AMERICAN METAL TURNINGS CRUSHERS



PERFORMANCE DATA

TWO CRUSHERS:	Model 3800's
AVERAGE AGE:	35 months
MONTHLY TONNAGE:	1200–1500 tons metal turnings
PARTS COST:	to date, for both crushers: $1599.80
COST PER TON:	$0.03, including standby parts

THE experience of many blue chip manufacturers have shown that there are three important profit sources in every American installation: (1) American-reduced chips bring $4 more per ton on scrap market (2) Up to 50 gallons of recovered cutting oil per ton of reduced turnings (3) less storage . . . easier handling.

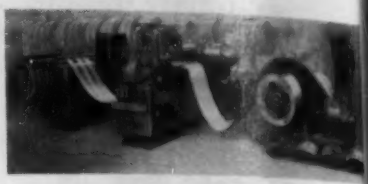
Let American show you how you can turn your scrap into profit.

WRITE for Bulletin: "Metal Turnings Crusher."

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1439 MACKLIND AVE., ST. LOUIS 10, MO.



Rotary slitter

A precision rotary slitting line has many new and exclusive features which are claimed to provide greater speed, easier operation, more flexible control and increased economy of production. The standard Herr precision slitter will handle material up to 0.125 in. thick, but can be adapted as a driven slitter to handle extremely thin material with accuracy and trouble-free operation. *Herr Engineering Co.*

For more data circle No. 31 on postcard, p. 11

Oil-tight pushbuttons

Dependable operation even under constant oil flooding is claimed for a new line of oil-tight pushbutton controls. Comprising the line are standard, extended and mushroom buttons, 2- and 3-position selector switches, and pilots, together with suitable legend plates. Units may be mounted directly on machines, or in control cavities. Oil-tight enclosures of heavy cast aluminum are supplied for mounting any unit or combination of units close to the machine, handy to the operator. Complete interchangeability is a basic feature of the line. *Arrow-Hart & Hegeman Electric Co.*

For more data circle No. 32 on postcard, p. 11

Metal dry cleaner

High cutting action and quick, clean evaporation assures high performance of a new metal degreaser called Flo. Technically, this is a Flowlene degreasing solvent. The product is said to be relatively odorless, is easy to handle, and is safe for use in all types of equipment designed for liquid phase solvents. It is formulated for use in recirculation solvent degreasing machines employing a flow of solvents over the parts while they are being brushed. *Curran Corp.*

For more data circle No. 33 on postcard, p. 11

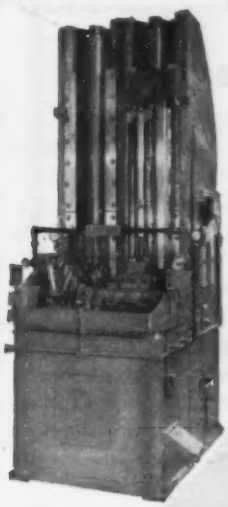
Turn Page

IN LAPOINTE BROACHING

50 YEARS IN BROACHING ! We're the oldest in the world !
1902 • GOLDEN ANNIVERSARY • 1952

You don't need to advertise for more skilled operators to meet extraordinary production schedules . . . when you're equipped with Lapointe Broaching Machines and Broaches.

That is why, with the baffling shortages of skilled workers, many production men are taking time out in the midst of emergency programs to investigate Lapointe broaching, for insurance against future man-power shortages. Through broaching you are assured of repetitive accuracy, together with remarkable production speed.



LAPOINTE
Broaching Machines
operate with push-button controls, and have safety devices that eliminate all possibility of incorrect operation or of harm to the operator. Then, too, with all of the accuracy actually engineered into the broach itself, the usual problem of rejects and re-work is eliminated.

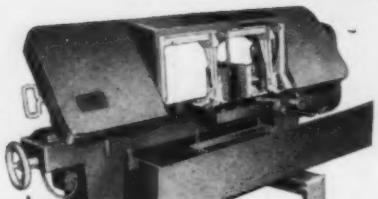
Full information is available in our illustrated circular on Lapointe Double Ram Vertical Broaching Machines. Write for Bulletin DRV-9.

THE LAPOINTE MACHINE TOOL COMPANY
HUDSON, MASSACHUSETTS • U. S. A.
Branch Factory: Watford, Herts., England

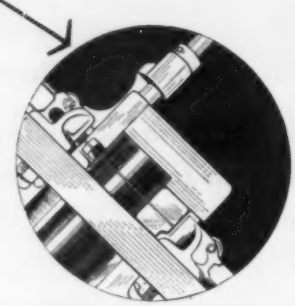
HUDSON LAPOINTE MASS.

THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHING MACHINES AND BROACHES

you can see the CUTTING ACTION



Kalamazoo METAL CUTTING BAND SAW



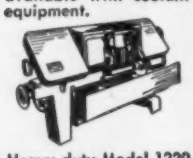
Yes . . . you can look directly down into the cut as it's being made, giving you instant warning of any need for adjustment. And blade wear and dullness can be quickly detected, too. Result? Faster, cleaner precision cutting, longer blade life.
Investigate the many other exclusive Kalamazoo Band Saw features that give you lowest cost metal cutting. Three sizes, all available with coolant equipment and casters.

MACHINE TOOL DIVISION
Kalamazoo TANK and SILO CO.
716 HARRISON ST., KALAMAZOO, MICHIGAN

Remember . . . there's a Kalamazoo Metal Cutting Saw to fit your exact needs

Model 610 cuts 6" round and 6" x 10" flat. Coolant equipment available.

Model 816 cuts 8" round and 8" x 16" flat. Model 824 cuts 8" round and 8" x 24" flat. Both models are available with coolant equipment.



Heavy-duty Model 1220 cuts 12" plus on rounds and 12" x 20" flat. Available with or without coolant equipment.

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HOUSEHOLD APPLIANCES
ELECTRICAL EQUIPMENT
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ESTABLISHED 1914
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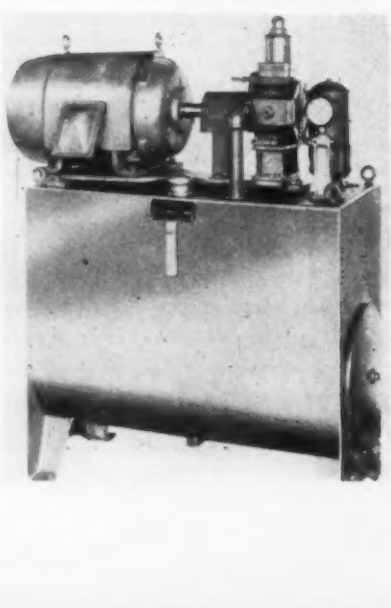
J.I.C. power units

Compact, space conserving J.I.C. power units are now manufactured in 30, 60 and 80 gal standard sizes. The units are assembled with Superdraulic or any other make pump specified by the customer. In addition to pump, motor, valving, etc., the design features such details as ample floor clearance, large tank cleanouts in both ends, sight gages, filler and bleeder caps on both ends and oil filters. *Superdraulic Corp.*

For more data circle No. 34 on postcard, p. 115



—New Equipment—

Continued

Indexable carbide tool

Called the Futurblade, a new indexable lathe tool permits a standardization program of the same blade for both milling and turning operations. Greater rigidity is the primary advantage claimed for this tool. Practically the entire shank size is beneath the solid carbide cutting blade, and both the blade and seat on which it rests are superfinished to gage block flatness. The solid carbide cutting blade can be indexed eight times and sent to the manufacturer for regrinding at a minimum charge. *Detroit Milling Cutter Co.*

For more data circle No. 35 on postcard, p. 115

Floor resurfacer

Grease and oil resistant plastic floor resurfacer can be laid over an old floor of wood, concrete or metal. For use in industrial plants, Daster X will stand up under approximately 3000 lb of trucking. It is furnished in 50 lb bags, together with the proper liquifier. It may be troweled directly onto the surface by unskilled labor to smooth out to a tile-like finish; requires no bonding agent or primer. *Dasco Chemical Co.*

For more data circle No. 36 on postcard, p. 115

Electric insulation

A new silicone resin for Class H electric insulation reportedly maintains its bonding strength and hardness at temperatures 50° to 90°C above any known commercially available silicone resin. Designated as SR-98, the product permits greater design flexibility in motors, transformers, and generators where vibration is a factor. *Chemical Div., General Electric Co.*

For more data circle No. 37 on postcard, p. 115

Aluminum paint

Bright permanent finishes on metal surfaces are possible with Super-Hot, a new ready-mixed aluminum paint. When applied to practically any metal surface it becomes permanently bonded upon subjecting the painted metal to 500° to 1600°F heat. *Sheffield Bronze Paint Corp.*

For more data circle No. 38 on postcard, p. 115

Nylon powder

A finely divided nylon powder, having a particle size below 10 microns, is produced by a special chemical process that makes it suitable for cold pressing and sintering techniques, similar to those practiced in powder metallurgy. Known as Nylasint 66, the powder lends itself to the production of sintered nylon bearings, gears, cams, rollers, valve seats, and other industrial products. *National Polymer Products, Inc.*

For more data circle No. 39 on postcard, p. 115

Fingerprint remover

Gulf No-Rust FPR is a new compound capable of removing damaging fingerprints and other similar corrosive materials from fine finished surfaces, and establishing a corrosion preventive film sufficient to protect the part between manufacturing operations and during temporary storage. It contains a highly effective and potent rust preventive. It may be applied to steel, brass, copper, cadmium, magnesium, zinc, and other metal surfaces by dipping, flooding, or spraying. It is recommended for application to freshly machined metal surfaces of fine finish and close tolerances. *Gulf Oil Corp.*

For more data circle No. 40 on postcard, p. 115

Nozzle puller

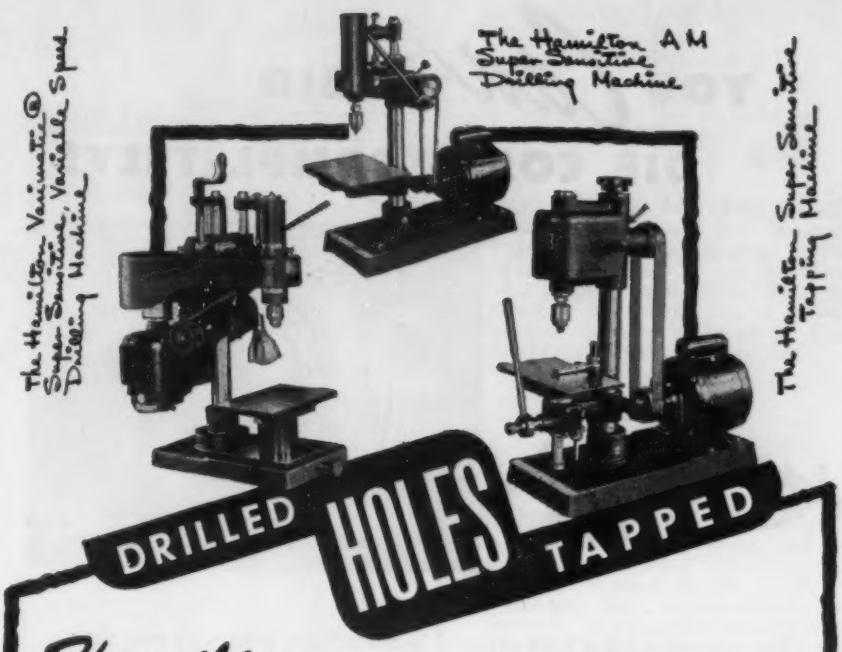
A new puller for removing the fuel injection nozzle from the cylinder head on International Harvester diesel engines is said to be fast and efficient. It exerts a straight, powerful pull and does the job in minutes. The tool is adjustable. May be used for other pulling jobs. *Owatonna Tool Co.*

For more data circle No. 41 on postcard, p. 115

Fast cutting file

Fast cutting and long life with a minimum of clogging are claimed for a new Multi-metal file designed for the machinist who must work on a wide variety of metals. The files have special tooth shapes and spacing so that the same tool will cut aluminum, brass, copper, iron and steel, and other metals. Sides are double-cut; edges are single-cut. *Henry Disston & Sons, Inc.*

For more data circle No. 42 on postcard, p. 115


The Hamilton Varimatic® Super-Sensitive, Variable Speed Drilling Machine
The Hamilton A-M Super-Sensitive Drilling Machine
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MAKE TIME • SAVE COSTS ON ACCURATE SMALL HOLE PRODUCTION

Small holes . . . *tiny holes* . . . in materials of such diverse characteristics as fiber and monel, ceramic and bronze, are being drilled and threaded speedily, accurately, *profitably* . . . NOW . . . by thousands of Hamilton Drills and Tappers.

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The Hamilton A-M DRILL,
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each a bench type, super-sensitive machine with ample clearances and travel, incorporate such precision that work is always held well within the tolerance allowed, and such stamina that they maintain their accuracy year after year even under heavy production loads. Our free Bulletin No. V-472 provides full information including specifications. Write now! Tomorrow you may need the information.

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YOU *Can* AVOID DIE COSTS COMPLETELY!

Yes, you can – but it's not *necessarily* the best thing for you.

You want the lowest unit cost – *for the life of the part,* including re-runs. It may well be that our **Machine-Cut Method,** with no die cost, does work out best.

Or, it might better be our **Short Run Method,** using economical blanking dies and stock punches.

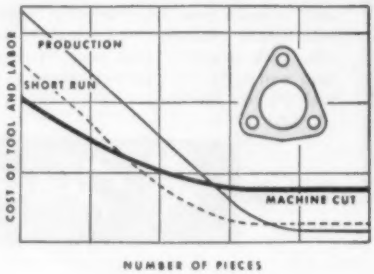
Sometimes, even with very short runs, it pays to use our **Production Method** with a standard die or our own surprisingly inexpensive Hecht-type tool.

In *any* case, the decision is a technical one based on many factors, not just length of run. You save money when the correct decision is made.

WE USE ALL THREE METHODS — LET US MAKE AN IMPARTIAL DECISION FOR YOU

For example, take the part illustrated. From 1-65 parts, our Machine-Cut Method is most economical. At 65 parts, the Short-Run Method is best until, at 7,000 units, the standard Production Method is most satisfactory.

These breaking points as charted vary drastically with every stamping, but the general principle remains the same.



LAMINATED SHIM COMPANY, INC.

Manufacturers of ALL TYPES OF SHIMS

STAMPINGS DIVISION

"ONE PIECE OR ONE MILLION"

STAMPINGS DIVISION, LAMINATED SHIM COMPANY
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Gentlemen:

Please rush me my free copy of "SERVICE IN STAMPINGS"—the 12-page, illustrated booklet full of helpful facts on the economical buying of stampings.

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CITY_____ ZONE_____ STATE_____

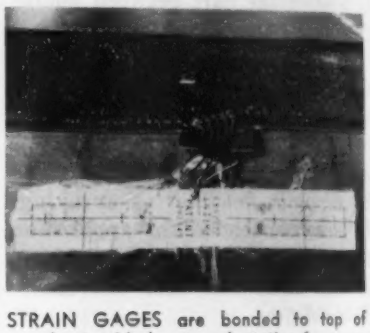
—Technical Briefs—

Testing:

Helicopter blades tested in flight for stress, strains

Measurement of major strains in helicopter rotor blades while in flight is now a routine procedure at Piasecki Helicopter Corp. for checking the performance of new types and sizes of rotors against their design strength and actual maximum flight stresses.

Distribution of stresses in each blade, their magnitude, direction, and frequency are measured while the rotor is turning to drive the helicopter, and the blades are undergoing both cyclic changes of pitch and pilot-controlled changes of pitch and direction to guide the helicopter.



STRAIN GAGES are bonded to top of metal rotor blade at each station for measuring flap bending strains. Two other gages at this station are on bottom of blade. Wiring is in flat pack bonded along blade.

Changing Pitch — In forward flight the three blades of each rotor are constantly changing pitch, each going through a rotational cycle of pitch variation which is regulated by the pilot for partial control of the direction of movement of the helicopter.

Strain measurements are made with Baldwin SR-4 bonded resistance wire strain gages. More than 50 gages and a wiring harness are bonded to a single rotor blade without appreciably affecting blade reactions through increase in weight or blade contour.

Special slip rings carry the very small electric currents between the moving strain gages and stationary instruments in the cabin of the helicopter without loss from resistance drops or "scrambling" of currents.

No More "Blue Mondays" in your Plant

Every working day is a "washday" of sorts in metalworking plants like yours. Because there are plenty of production line cleaning jobs that call for the removal of dirt . . . soil, oil, dust, rust, greases, films and compounds of many kinds.

These are the types of cleaning and scouring operations that have nothing to do with soap and water—or "elbow grease." Specially formulated cleaners are required—fast-acting solutions that spread over metals, dig under the dirt and whisk it away with dispatch.

Houghton research over the years—constantly finding new ways to speed processing in metalworking plants—has resulted in products that are helping to make metal cleaning, pickling, plating, tumbling and similar operations more efficient. And at lower costs, metalworking plants report.

Some of these popular Houghton products are described on this page. For further information—and a list of other Houghton products relating to your cleaning problems—ask the Houghton Man when he calls at your plant. Or write directly to E. F. Houghton & Co., Philadelphia 33, Pa.

E. F. HOUGHTON & CO.

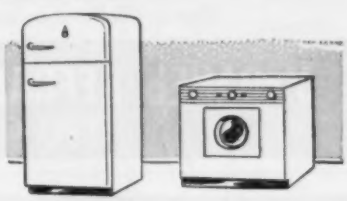
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

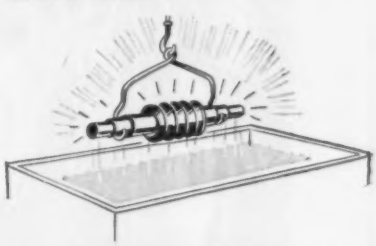
Metalworking and Textile Processing Products · Lubricants · Packings · Leather Belting

Tough Cleaning Jobs Turn "Sissy" *when Houghto-Clean 220* is used. This popular emulsion-type metal cleaner works fast . . . and it's often used in place of alkaline cleaning. Effective in spray, dip or power washing (diluted as much as 1 to 50!). Like further information?

Cleaning of Parts for Chrome Plating is swift and sure when one of Houghton's *"Cerfak"* synthetic detergents is used in the bath. A prominent car manufacturer, for example, has reported switching to "Cerfak" after extensive tests because it has such exceptional wetting ability and detergency in the pre-plating bath.



Paints "Hold Tighter" after metal is cleaned with *Houghto-Clean 313.* A phosphate cleaner that provides a perfect bonding agent. Leaves a light tough film that "anchors" paints, enamels and lacquers to metals. Also helps prevent corrosion if finish is scratched or broken. A type for either ferrous or non-ferrous metals.



Cleaning Oil-Quenched Work is a job best suited for Houghton's *Cerfak Liquid*—ideal for work heat treated in salt baths. Manufacturers find Cerfak Liquid 6 to 10 times faster than old style cleaners. Only a short soak is needed. *Cerfak Liquid* works so thoroughly that hand brushing of threaded and recessed parts is eliminated. Being so economical, it's widely used for around-the-plant cleaning, too.

Houghton Pioneering in metalworking and processing fields has resulted in a vast amount of helpful production data. Whatever your cleaning problems, ask the Houghton Man. For new cleaning folder, write to E. F. Houghton & Co., Philadelphia 33, Pa.

"A LONG, LONG LIFE and ALL-OUT SERVICE"

McDANEL HIGH TEMPERATURE COMBUSTION TUBES

For Carbon and Sulphur Determinations

Made of a highly refractory porcelain body exclusively developed to provide maximum resistance to thermal shock, McDanel Combustion Tubes cut control costs to rock bottom by their long wear. Their *service record* in metallurgical laboratories from coast to coast has made them favorites since 1919.

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Refractory Porcelain Specialties to meet specific needs can be "custom-made" by McDanel to do the job. Standard flasks, retorts, crucibles, etc., available immediately on order.

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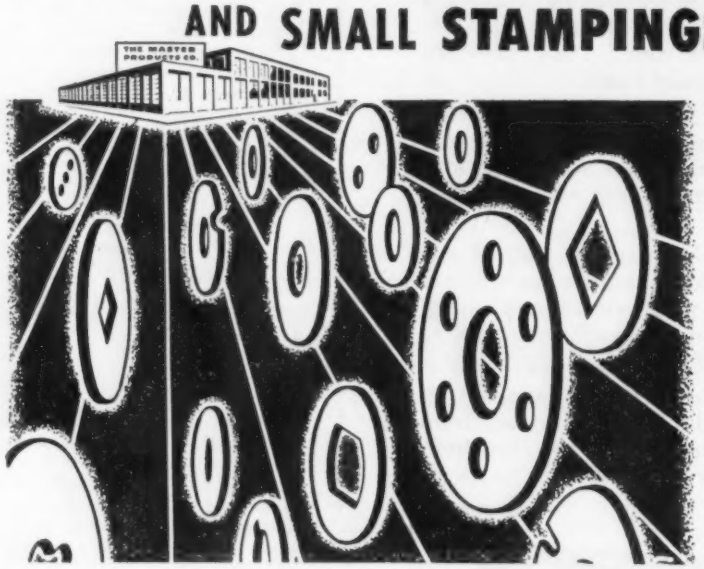
STANDARD AND SPECIAL WASHERS AND SMALL STAMPINGS



More than 30 years of experience in designing and producing Special Washers and Small Stampings . . . more than 12,000 sets of tools at your disposal. Any metal . . . any quantity. *Your inquiries will receive prompt and careful attention.*

THE MASTER PRODUCTS CO.
6400 Park Avenue Cleveland 5, Ohio

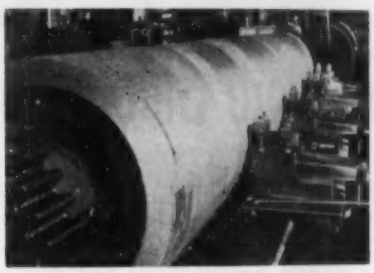
—Technical Briefs—

Machining:

50 yr old lathe does tough turning job faster with carbides

Use of tungsten carbide inserts cut turning time 83 pct and eliminated much regrinding for an Eastern paper processing equipment producer. Cast iron drier rolls, 60 in. in diam, are machined, using Kendex tungsten carbide inserts.

The huge, 14-ton rolls are supported by spiders on each end of a 14-in. diam shaft and machined on a 50-yr-old Niles engine lathe. Prior to use of carbide tooling, turning was done with four high speed steel tools at 14 sfm, ⅛ in. feed per revolution, and 3/16 in. maximum depth of cut. Rapid edge wear on the tools caused taper which necessitated an additional cut for its removal. Total turning time was 16.8 hr.



MACHINING TIME for cast iron drier rolls, 60 in. in diam and 226 in. long, was cut 83 pct using tungsten carbide inserts. Machining is done on Niles engine athe.

One Pass—Four Kendex insert tools, produced by Kennametal, Inc., Latrobe, Pa., now being used on this job, complete the turning operation in one pass, each tool cutting about 56 in. of the total length. Feed and depth of cut remain the same as previously used, but speed has been increased to 41 sfm (maximum due to condition of machine). Turning time is now 2.9 hr.

Inserts are rotated to a new cutting edge after turning each drier roll. Approximately nine new cutting edges are available per insert before regrinding is required. Tool insert life is about 17 regrinds and approximately 153 rolls may be turned per set of four inserts.

Gloom Grips Industry As Strike Losses Mount

Slimmest of issues separates union and companies . . . But both are deeply entrenched . . . Unemployment and dollar losses mount . . . No settlement in view . . . May seize some.

Deep gloom settled over the steel market this week as the industry found itself in the eighth week of strike without a ray of hope that it could be settled quickly. Differences between the companies and the United Steel Workers were paper-thin. But the position of each was so deeply entrenched as to make consumers despair of relief from the stranglehold on their source of supply.

The Cost—Here's what it is costing: (1) Steel production losses will total 17 million tons by the end of this week. (2) Unemployment is estimated at nearly 2 million workers (about 600,000 are in steel). (3) Average wage loss to steelworkers is about $600.00. (4) Total loss to the economy is estimated at $4 billion.

These losses will continue to mount even after the strike is settled, because steel deliveries can not be resumed at once. To them can be added the uncounted cost manufacturers will encounter in converting unfinished or unsuitable steel into a form which will permit them to keep their plants going.

The Issue—The strike issue is union security or union shop. Stripped to barest principle the industry and union positions shape up like this: The union wants compulsory union membership. The companies do not.

For several years steel wage contracts have provided for union security with a "maintenance of membership" clause which allows a 15-day period when workers can get out of the union if they so desire. The union would like to eliminate this "escape" period. The companies say this would mean union membership forever, that it would perpetuate the union monopoly. Union membership now totals more than 90 pct of workers in major steel companies.

The Terms—Economic matters have been resolved at a cost of about 25¢ per hr per employee. So have steel prices, to the tune of $5.20 per ton.

Still, on this fine line of union security is based the longest and costliest strike in history. The only visible means of restoring production is the Taft-Hartley Law, which President Truman has made it rather apparent he doesn't intend to use.

Seizure Again — If the White House decides to again seize some steel companies under provisions of the Selective Service Act it will be an indication that it has failed in its efforts to end the strike.

This course of action — which would involve a host of legal technicalities and reams of red tape— was considered early in the deadlock and abandoned on the grounds that it was not "feasible." A fresh attempt at seizure by the President would also be in direct oppositon to a congressional mandate which he himself requested at a special session of both houses.

The Motive—The real motive of another seizure attempt is viewed as a means of taking Union Chief Philip Murray off the hook. It will be recalled that one week after the strike started the union leader and industry representatives pledged to reopen selected steel plants to produce military and atomic energy orders. This has not been done, although steel companies have repeated their offer, despite the sure knowledge that cost of such limited operation would be sky high.

Consumers are getting ready for one of the worst steel scrambles in history. Ending of the strike will be like the signal for a land rush. Even while the strike continues some manufacturers are scouting conversion possibilities. Their anxiety is evidenced by their willingness to snap up anything available. For example, one Detroit firm is reported to have "found" some ingots in an operating Alabama mill and arranged to have them shipped to St. Louis for conversion. Compared with this firm's needs this can be only a drop in the bucket and will extend production only slightly.

Life Lines — Other steel users are displaying equal ingenuity in keeping their plants operating. In order to piece out unbalanced inventories and make them go farther some companies are cutting stock to desired sizes. Some are even stripping bars out of plates. A limited amount of foreign steel is seeping in at an average of about 50 pct above domestic mill prices. All these measures are costly, but they keep plants running.

Warehouses have been life savers to a lot of companies. As production lines near a halt for lack of specific steel items, an emergency call to warehouse suppliers sometimes bails them out for a few more days. But the possibility of help from warehouses becomes more remote as the strike continues.

Slight Gain—Steelmaking operations this week are scheduled at 15.5 pct of rated capacity, up half a per cent from the previous week.

This steel bar

MACHINABILITY

puts parts in the pan...fast!

● Automatics hum a steady tune of *production* when they're running Union Cold Finished Steel Bars. Spindles whirl . . . tools bite into stock . . . and finished parts thump steadily into pans. That's MACHINABILITY—the Union Drawn kind.

Research has made Union Drawn Steel "MACHINABILITY Headquarters." Research that includes many years of actual production-line experience in steel users' plants . . . plus the unequalled facilities of famous Union Drawn machining laboratory.

That's why today's Union Cold Finished Steels consistently produce top ratings on feeds and speeds . . . freedom from abrasive elements . . . long tool life . . . smooth, bright machined surfaces...high production rates...low unit parts costs.

How about your production? Perhaps a session with one of Union Drawn's field technicians could help on set-up, tooling or other phases of machining steel . . . or, on cyaniding, carburizing, carbon correction and other forms of surface treatment. Just contact your Republic District Sales Office, your Union Drawn Distributor, or write:

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Union Drawn Steel Division • Massillon, Ohio
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NEED STILL MORE SPEED?

Union Drawn's newest fast-machining grade, B-1113X, could be your solution. Where your equipment and parts design are such that faster speeds and heavier feeds are practical, "X" steel may help boost production still higher. Ask your Union Drawn field man when he calls. Or, write for free booklet 554, "Republic Union Drawn 'X' Steels." It's one of the six handy information-packed booklets in the Union Drawn "Pocket Library."

Republic UNION COLD DRAWN STEELS

REPUBLIC STEEL

Market Briefs

Pig Short—Shutdown of blast furnaces due to steel strike is starting to take its toll on once heavy pig iron inventories. Buyers of gray iron castings report increasing difficulty in the ability of their foundry suppliers to fill orders. As a result the cast iron scrap market is starting to firm up with price gains noted in even such weak areas as St. Louis and Birmingham.

Fuel Outlook—Outlook for adequate supplies of industrial fuels this winter is much improved over last. Increasing stocks of residual fuel oil indicate there will be no tightness in that direction. Completion of natural gas pipelines in the Appalachian area will permit greater use of the fuel this winter. New England supply of natural gas is also expected to be improved. Tight spots in natural gas demand will be centered in Michigan-Wisconsin region.

Brazilian Bauxite—A geological survey expert, Dr. Samuel Goldich left last week for Brazil where he will assist Brazilian geologists to examine and assay the value of Bauxite deposits in the state of Minas Gerais. Assistance is part of the Point Four program and will center in the Pocos de Caldas area of the state.

Extended—Interstate Commerce Commission has again extended the cutoff date of Service Order 884 which permits ore to be loaded on railway cars at Lake ports and held free of demurrage charges. New expiration date is July 31.

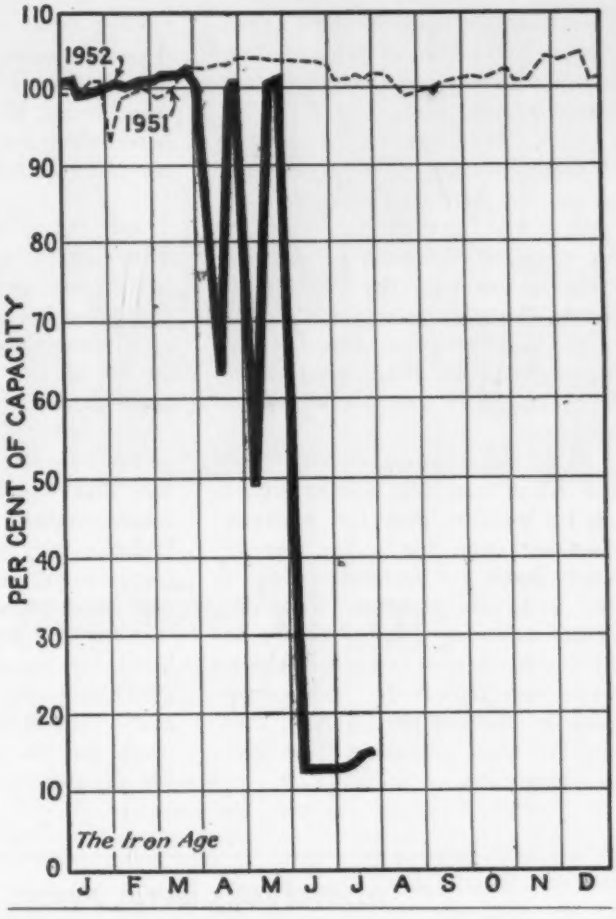
Merger Planned—Plans for merger of U. S. Pipe & Foundry Co., Burlington, N. J., and Sloss Sheffield Steel & Iron Co., Birmingham, are being made. U. S. Pipe owns 55 pct of Sloss stock. Sloss Sheffield has called a special meeting of stockholders for Aug. 12 to amend its certificate of incorporation so it will be identical with that of U. S. Pipe required by New Jersey law under which the latter is incorporated. At a later date stockholders of both companies will be asked to vote on the proposal.

Military Steel — Steel users are worried about the amount of steel that will be captured by the military after the strike. At the latest huddle between industry and government officials on steel distribution it was made clear that loss of steel deliveries to military customers would have to be made up after the strike ends. One reason government estimates of the military take have been running about twice as high as industry estimates is that the government includes B products going to military use. Right after the strike the military take might be more than 39 pct of steel output.

Atomic Contracts—Atomic Energy Commission last week awarded two big construction contracts. A $464 million addition at Oak Ridge will be built by Maxon Construction Co. of Dayton. Prime contract for the $459 million separation plant addition at Paducah, Ky., went to F. H. McGraw & Co., Hartford.

Mica Depot—A new purchase depot for high grade mica will shortly be open for business at Franklin, N. H., under the direction of General Services Administration. Similar stations are being opened at Spruce Pine, N. C., and Custer, S. Dak. Prices will range from $3 per lb for Nos. 5½ and 6 to $70 per lb for No. 3 and better. About $600 a ton will be paid for specified hand-cobbed mica.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
July 13	8.0	5.0	11.0	16.0	26.5	5.0*	0.0	49.0*	51.0	3.5	37.0	68.0	14.0	15.0
July 20	8.0	5.5	11.0	16.0	26.0	5.0	0.0	50.0	50.0	3.5	37.0	73.5	14.0	15.5

Beginning Jan. 1, 1952 operations are based on annual capacity of 108,587,670 net tons.
* Revised.

May Sign Aluminum Labor Pacts

Kaiser settled with USW, Alcoa with Aluminum Workers . . . Union shop an issue only with Alcoa . . . Price meetings start next week . . . Brass labor outlook glum—By *R. L. Hatschek.*

Accord may be reached in the aluminum industry sooner than in steel. This is a rather unexpected turn resulting primarily from three factors: (1) The steel case is dragging its feet on the union shop issue, (2) Aluminum Co. of America has come to a mutual agreement with the AFL Aluminum Workers Council and (3) the union shop is not as much of an issue in the aluminum industry as in steel since both Reynolds Metals Co. and Kaiser Aluminum & Chemical Corp. already have the union shop even though Alcoa doesn't.

Alcoa, Kaiser Sign—Alcoa had already signed a 5-year contract with the AFL covering 30 pct of its workers without a union shop. Negotiations with the CIO United Steel Workers were just getting under way at press time. What stand the steelworkers were taking on union shop was not known at the time.

In an agreement quite similar to the Alcoa contract, Kaiser signed up its workers over the weekend. Contract calls for a 16¢ per hr wage boost retroactive to Jan. 1 and a 4¢ annual productivity increase effective July 1, this year. Shift differentials and other fringes were also improved. The agreement is effective until July 1, 1954 but the wage aspects will be open for inspection next July 1.

Hopes High — While there has been no word of Reynolds' negotiations with the union, no great difficulties should arise since a union shop already prevails in that company.

People in the industry generally are feeling pretty optimistic about the nearness of a settlement. Wage Stabilization Board has never made any specific recommendations in the case—a fact which may help rather than hinder negotiations. Another factor which may speed the settlement is that the government would like to see agreement here before the present WSB bows out of the picture on July 29.

Ask Price Hikes — These new wage contracts, together with the very good price record of the aluminum industry, make a strong case for a price increase. Washington doesn't like the flavor of labor contracts that go into effect *if* a price increase is granted. For some reason, the price stabilizers feel that wages and prices aren't interdependent. But nevertheless it looks very much as though an increase will be permitted without any great struggle.

Alcoa has requested a 2¢ per lb boost for pig aluminum and a 10 pct hike for ingot, semi-finished and fabricated products. This would put the ingot price at 20.9¢ per lb and the pig price at 20¢. Meanwhile, Kaiser is reported to have requested a 12.7 pct increase for all products. This, if granted, would put pig and ingot at 20.28¢ and 21.41¢, respectively. Reynolds has made no requests as yet. Washington meetings on the subject are scheduled for early next week.

The one dead certainty is that this country must avoid a strike in the aluminum industry. Intelligent cooperation and a give-and-take attitude should make it possible to come to generally satisfactory terms for all sides.

Brass Troubles—While the picture in aluminum is pretty bright, the situation in the brass mill industry is just the opposite. Little progress seems to have been made in disputes affecting several companies. Plume & Atwood was forced to let its office workers go for the duration of the strike. Negotiations have been cut off and no date set for their resumption.

In a letter to employees, the company blamed everything on the leaders of the United Auto Workers in Detroit while offering the workers an 11¢ raise any time they decide to go back to their jobs. Both parties are taking a very tough attitude.

Zinc Prices—Many people in the zinc trade feel that another price cut is due for that metal—possibly 1¢ per lb lower. Reason, of course, is that the market has been practically dead since the steelworkers left their jobs. Zinc stocks are at a very high level and are piling up all the time. Lead, zinc's twin, is steady with sales on a good level.

Mercury Market—Quotation on mercury is off to $190 to $193 per 76-lb flask. Reason was the price cut effected by the Spanish producers. Domestic miners are looking over their shoulders, remembering how the Europeans cut prices so low that all U. S. producers but one were forced to suspend operations. Just 2 years ago the price was $70 to $71 per flask.

NONFERROUS METAL PRICES

	July 16	July 17	July 18	July 19	July 21	July 22
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.215	$1.215	$1.215	....	$1.215	$1.215
Zinc, East St. Louis	15.00	15.00	15.00	15.00	15.00	15.00
Lead, St. Louis	15.80	15.80	15.80	15.80	15.80	15.80

Note: Quotations are going prices.

"Four operations instead of one and you call that a substitute!"

That furious fist is smashing home a point that can't be made too often — in countless applications, *there's no substitute for Brass.*

What has upset the "top brass" here is a simple little base for an electronic tube. But the poor purchasing agent, *accepting the copper and brass shortage without question*, also accepted a substitute for Brass. Then the production panic started . . . four forming operations on the substitute material, where Brass (with its easy, even "flow") needed only *one operation*. Production began to limp. Deliveries slowed. Distributors, dealers, customers began to look around.

Then the tube-maker found Brass was available after all. So take a leaf from this "Book of Martyrs" and don't make the same mistake. If *you* use Brass in fabrication, *then stick to your guns*, and don't settle for anything less. In fact, call Bristol (Conn.) 9246 and get the best sheet, rod, or wire that you ever put into your product!

• • •

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"Bristol-Fashion" means **Brass at its Best**

Nonferrous Prices

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

Plate ¼ in. and heavier: 2S, 3S-F, 28.3¢; 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.

Extruded Solid Shapes: shape factors 1 to 5, 36.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 26, 39.6¢ to $1.16; 36 to 38, 47.2¢ to $1.76.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 33.5¢; cold finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 35¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32 in., 53.5¢ to 42¢; ⅜ to 1½ in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 39.5¢ to 29¢; 52S, 48¢ to 35¢; 56S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 63S-ST-5, OD in in.: 1¼ to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.42; 96 in., $1.522; 120 in., $1.902; 144 in., $2.284. Gage, 0.24 x 28 in., 72 in., $1.879; 96 in., $1.839; 120 in., $2.299; 144 in., $2.759. **Coiled Sheet:** 0.019 in. x 28 in., 28.2¢ per lb; 0.024 in. x 28 in., 26.9¢ lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 63¢; 3/16 in., 65¢; ⅛ in., 67¢; B & S Gage 10, 68¢; 12, 72¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311 in., 74¢; ½ to ¾ in., 57.5¢; 1¼ to 1.749 in., 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ⅝ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.8¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057; ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ⅞ to ¾, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	77	60½
Strip, cold-rolled	83	63½
Rods and bars	73	53½
Angles, hot-rolled	73	53½
Plates	75	59½
Seamless tubes	106	93½
Shot and blocks	..	53½

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	45.52	....	45.12
Copper, h-r	....	41.37	....
Copper, drawn	....	42.62	....
Low brass	42.34	42.03	....
Yellow brass	40.17	39.86	....
Red brass	43.10	42.79	....
Naval brass	44.72	38.78	40.04
Leaded brass	....	....	38.62
Com'l bronze	44.39	44.08	....
Mang. bronze	48.44	42.83	43.89
Phos. bronze	64.72	64.97	....
Muntz metal	42.69	38.25	39.50
Ni silver, 10 pct	51.96	54.18	....

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	19.00
Aluminum pig	18.00
Antimony, American, Laredo, Tex.	39.00
Berryllium copper, 3.75-4.25% Be	$1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be	$69.50
Bismuth, ton lots	$2.35
Cadmium, del'd	$2.25
Cobalt, 97-99% (per lb)	$2.40 to $2.47
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$200
Lead, St. Louis	15.80
Lead, New York	16.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.	24.50
Magnesium, sticks, 100 to 500 lb.	42.00 to 44.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$190 to $193
Nickel electro, f.o.b. N. Y. warehouse	59.58
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	52.75
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	82.75
Tin, New York	$1.215
Titanium, sponge	$5.00
Zinc, East St. Louis	15.00
Zinc, New York	15.83
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	27.25
No. 120	26.75
No. 123	26.25
80-10-10 ingot	
No. 305	33.00
No. 315	30.50
88-10-2 ingot	
No. 210	41.50
No. 215	40.00
No. 245	34.50
Yellow ingot	
No. 405	23.25
Manganese bronze	
No. 421	30.50

Aluminum Ingot

(Cents per lb, 10,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.6
0.60 copper, max.	20.4
Piston alloys (No. 122 type)	19.5
No. 12 alum. (No. 2 grade)	18.5
108 alloy	19.6
195 alloy	20.8
13 alloy (0.60 copper max.)	20.8
ASX-679	19.5
Steel deoxidizing aluminum, notch-bar granulated or shot	
Grade 1—95-97½%	18.80
Grade 2—92-95%	18.60
Grade 3—90-92%	18.40
Grade 4—85-90%	18.20

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	37.84
Electrodeposited	33¾
Flat rolled	38.34
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball, anodes	25½
Nickel, 99 pct plus	
Cast	76.00
Rolled, depolarized	77.00
Cadmium	32.40
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	97½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.35
Nickel salts, single or double, 4-100 lb bags, frt. allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz	67¾
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ⅛¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21⅛	20⅛
Yellow brass	19½	17⅝
Red brass	20½	18⅝
Comm. bronze	20½	18⅝
Mang. bronze	18½	17⅛
Brass rod ends	18⅞	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
Refinery brass	17.25*
Radiators	14.75

* Dry copper content.

Ingot Makers' Scrap

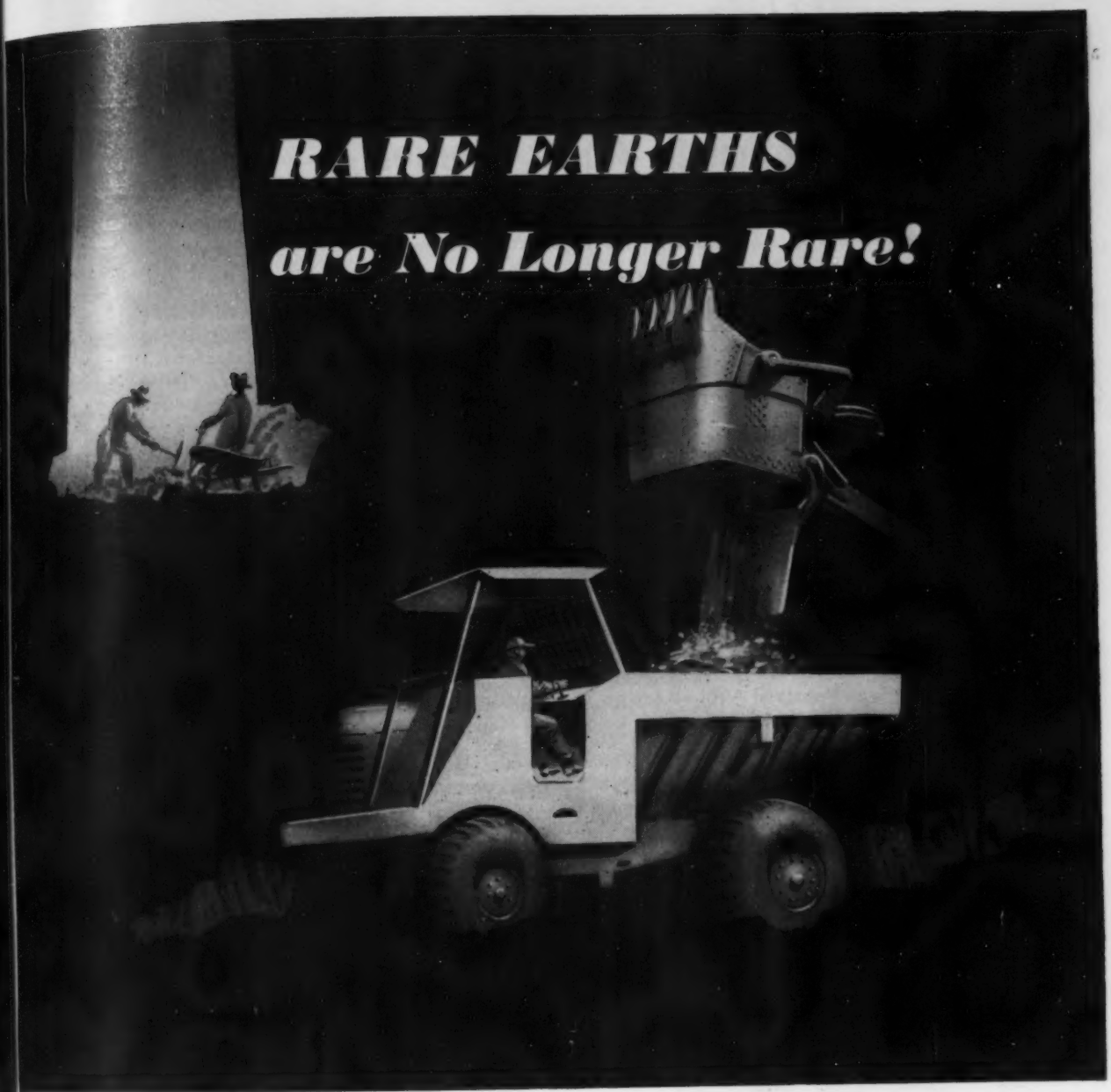
(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	18.50
No. 1 comp. turnings	18.25
Rolled brass	16.50
Brass pipe	16.50
Radiators	14.75
Aluminum	
Mixed old cast	9 — 9¼
Mixed new clips	10 — 11
Mixed turnings, dry	9 — 9¼
Pots and pans	8½ — 9

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	18¾ — 19
No. 2 heavy copper and wire	17 — 17¼
Light copper	15½ — 16
New type shell cuttings	15¾ — 16
Auto radiators (unsweated)	14 — 14½
No. 1 composition	17½ — 18
No. 1 composition turnings	17 — 17½
Unlined red car boxes	16½ — 17
Cocks and faucets	15 — 15½
Mixed heavy yellow brass	11½ — 12
Old rolled brass	14½ — 15
Brass pipe	15½ — 16
New soft brass clippings	16 — 16½
Brass rod ends	15½ — 16
No. 1 brass rod turnings	16 — 16½
Aluminum	
Alum. pistons and struts	6 — 6½
Aluminum crankcases	7 — 7½
2S aluminum clippings	10
Old sheet and utensils	7 — 7½
Borings and turnings	5 — 6
Misc. cast aluminum	7 — 7½
Dural clips (24S)	7 — 7½
Zinc	
New zinc clippings	5
Old zinc	4
Zinc routings	3 — 3½
Old die cast scrap	5 — 5½
Nickel and Monel	
Pure nickel clippings	35 — 36
Clean nickel turnings	35 — 36
Nickel anodes	35 — 38
Nickel rod ends	35 — 36
New Monel clippings	28 — 29
Clean Monel turnings	20 — 21
Old sheet Monel	28 — 29
Nickel silver clippings, mixed	13 — 14
Nickel silver turnings, mixed	12 — 13
Lead	
Soft scrap, lead	12 — 13¼
Battery plates (dry)	7 — 7½
Batteries, acid free	4 — 5
Magnesium	
Segregated solids	15 — 16
Castings	14 — 15
Miscellaneous	
Block tin	100 — 110
No. 1 pewter	70
No. 1 auto babbitt	55 — 60
Mixed common babbitt	14½ — 14¾
Solder joints	19 — 20
Siphon tops	60
Small foundry type	19 — 19½
Monotype	15½ — 16
Linotype and stereotype	13½ — 14
Electrotype	12 — 12½
Hand picked type shells	9¾ — 10
Lino. and stereo. dross	7
Electro. dross	6½



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Grant Building Pittsburgh, Pa.

MCA

Scrap Dealers Optimistic About Market

Looking forward to an end of the steel strike, dealers anticipate strong scrap demand . . . N. Y. market firming but there were few shipments . . . Orders from automen expected.

Dealers in most areas were feeling bullish this week. They had hopes of a settlement of the steel strike soon, and could count on strong demand when it happened.

In New York the optimism was paradoxical. The market was definitely firming up but there were practically no shipments. Cast demand was strengthening, but no price changes were reported. Reopening of the Fairless Works for shipments last week quickened the market, but deliveries were curtailed again on Monday. Deprived of this stimulus, the Philadelphia trade slipped back into the doldrums.

Business was looking up in Pittsburgh and the Valley, with dealers taking a "When The Strike Is Over" attitude. Valley scrap men reported electric furnace grades moving at ceiling, with other grades strengthening. Buyers were coming into the Midwest markets at ceiling prices. In Chicago this confused the situation as old orders were being shipped below ceiling, new ones at the limit.

Detroit dealers foresee a scrap shortage when the strike ends, particularly in electric furnace grades. Auto companies are planning to go in heavily for electric furnace ingots for post-strike conversion.

National Production Authority late last week removed its final restriction on auto wreckers by deleting references to them in connection with the records and reports section of M-20.

Pittsburgh—The market continued to show signs of strength. On appraisal, it was generally agreed that good No. 1 heavy melting steel and No. 1 bundles were worth more than had been indicated by two recent purchases. Industrial scrap and railroad scrap continued to command ceiling prices.

Chicago—The market here was affected last week by two purchasers coming in at ceiling in the district. One offered a $2 springboard. Effect was to leave some dealers still filling orders at $37.50 and $38.50 on No. 1 steelmaking grades, while new orders were being filled at the ceiling price. With the relatively slow market, orders were being filled quickly. Collections of industrial and agricultural scrap were low, and dealers continuing to lay in scrap. Scrap buyers in Chicago itself did not seem active at press time. Chicago area sales affected by the increase were No. 1 bundles, No. 1 heavy melting, machine shop turnings, No. 2 heavy melting, foundry steel.

Philadelphia—Business is so dead, according to one yard operator, "that things couldn't be quieter if we were shut down ourselves." Both strike and hot weather are taking their toll. Some people expect an almost immediate rebound to ceilings because of the poor collections once the strike ends. Prices are generally holding steady except for cast grades which are considerably stronger now. Fairless Works started accepting scrap delivery again last Thursday after the temporary hold-up order, then shut down Monday.

New York—The scrap market this week is a paradox. It's strong but there are practically no shipments. Cast is definitely firming up but there are no price changes. Some brokers feel that prices will hit ceilings as soon as the strike ends. But the weather is too hot for many people to care and it's certainly too hot to collect or cut scrap. Fairless Works, practically the only sizable outlet for scrap in the area, was accepting shipments for a few days, but then shut down again on Monday.

Detroit—Dealers are feeling somewhat bullish as they foresee a scrap shortage following an end of the steel strike. This feeling wiped out some spreads or lifted prices of some below ceiling grades about $1. A real shortage of electric furnace grades is foreseen as automobile companies are prepared to go in heavily for electric furnace ingots for post strike conversion. Firming market is still only based on speculation as sales are few because of the continuing strike.

Cleveland—Scrap market in Cleveland and the Valley continues on a strong tone this week. Dealers were more confident that prices would return to ceiling once the strike is over and substantial mill orders are placed. Industrial scrap is still moving at ceiling prices. Electric furnace grades were being sold in the Valley at ceiling. No. 2 heavy melting steel and No. 2 bundles were reported going into the Valley on the basis of $40.00 per gross ton delivered. Market for turnings seemed stronger and some added strength was being shown in cast iron scrap.

St. Louis—Two steel mills came into the market purchasing substantial tonnages of No. 2 heavy melting steel and bundled sheets at ceiling prices, being unable to get the wanted material for less. Deliveries are to be made within the next 30 days. Effect has been to strengthen the market for all openhearth grades, although other prices are unchanged. Some brokers who sold at below ceiling prices are buying at ceiling to fill orders. Cast iron grades continue dull.

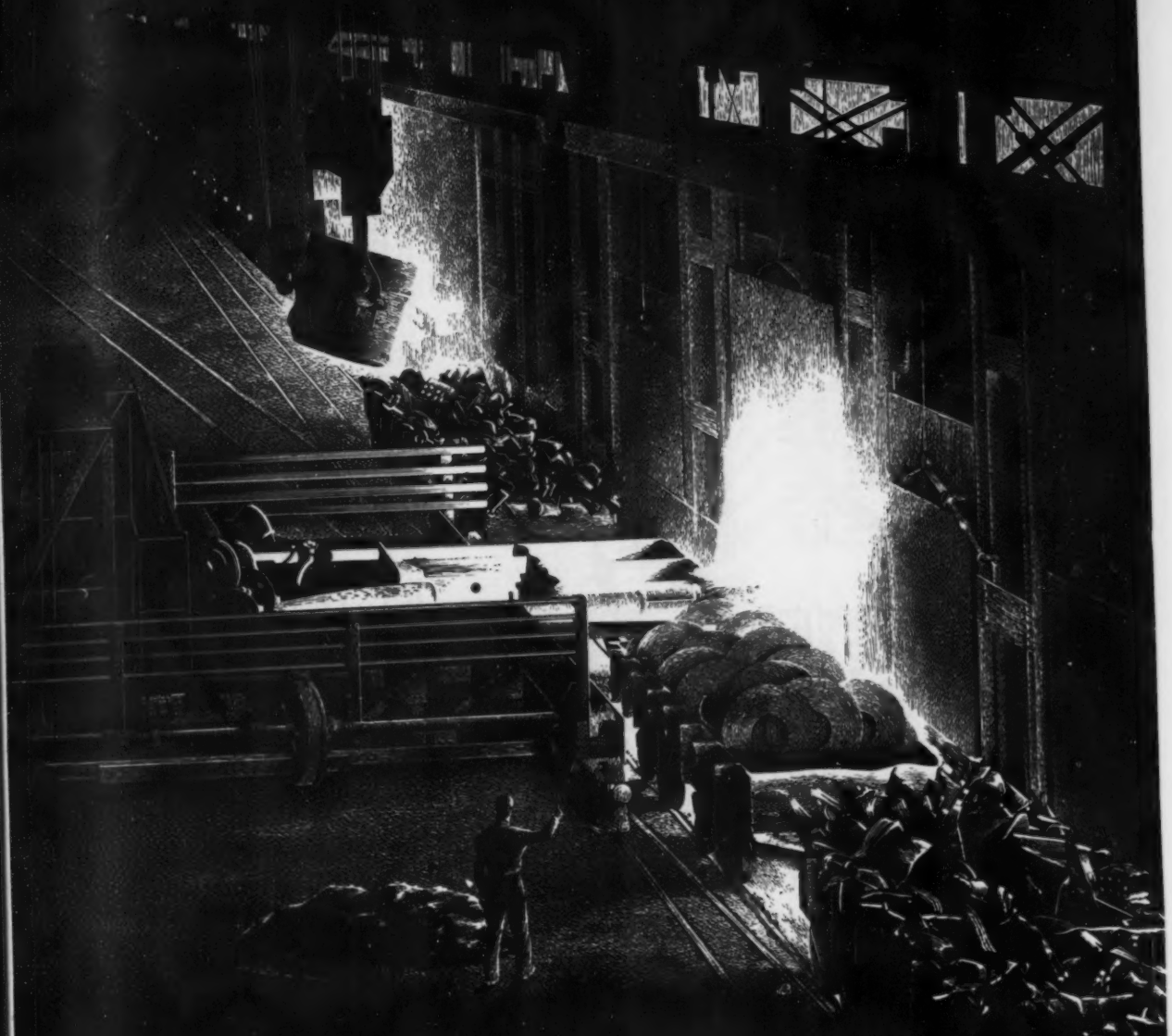
Birmingham—Cast scrap is becoming a little scarcer in the district as demand increases. One broker reports a sizeable delivery at $45 for cupola cast and $41 for stove plate. Other grades not selling here and prices unchanged. Electric furnace grades are moving at ceilings with freight limitations.

Cincinnati—Mills buying in the area are still receiving good shipments of dealer scrap. Industrial scrap is said to be slowing down to a mere trickle. Mills looking forward to August buying seem reconciled to the fact that they will have to pay ceiling prices for material with no freight concessions being made. Offerings have slowed and the market seems to be waiting for a strike settlement before a test of strength takes place.

Boston—There is a little flurry of activity in this area, caused by release of old orders. Prices are holding fairly steady, though some revisions were caused by changes in freight charges.

West Coast—Shortage of pig iron in the Los Angeles area brought cast scrap prices up to $45, a gain of $2 last week. Foundries in northern California and Northwest areas showed no changes in prices.

for the purchase or sale of **scrap**



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ST. LOUIS, MO. Railway Exch. Bldg.
SAN FRANCISCO, CAL. 100 Montgomery St.
SEATTLE, WASH. Smith Tower

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Scrap Prices

Pittsburgh

No. 1 hvy. melting	$41.50 to	$42.00
No. 2 hvy. melting	38.00 to	39.00
No. 1 bundles	41.50 to	42.00
No. 2 bundles	38.00 to	39.00
Machine shop turn.	28.00 to	29.00
Mixed bor. and ms. turns.	28.00 to	29.00
Shoveling turnings	33.00 to	34.00
Cast iron borings	32.00 to	33.00
Low phos. punch'gs, plate		46.50*
Heavy turnings	35.00 to	36.00
No. 1 RR. hvy. melting		46.00*
Scrap rails, random lgth.		48.00*
Rails 2 ft and under		52.00*
RR. steel wheels		51.00*
RR. spring steel		51.00*
RR. couplers and knuckles		51.00*
No. 1 machinery cast.		52.00
Cupola cast.		42.00
Heavy breakable cast.		45.00
Malleable		50.00

Chicago

No. 1 hvy. melting	$37.50 to	$42.50
No. 2 hvy. melting	37.50 to	41.50
No. 1 factory bundles	41.00 to	42.00
No. 1 dealers' bundles	37.50 to	42.50
No. 2 dealers' bundles	36.00 to	37.00
Machine shop turn.	25.00 to	32.50
Mixed bor. and turn.	28.00 to	29.00
Shoveling turnings	28.00 to	29.00
Cast iron borings	28.00 to	29.00
Low phos. forge crops	50.00 to	51.00
Low phos. punch'gs, plate		45.00*
Low phos. 3 ft and under	43.50 to	45.50
No. 1 RR. hvy. melting		44.50*
Scrap rails, random lgth.		46.50*
Rerolling rails		51.50*
Rails 2 ft and under		50.50*
Locomotive tires, cut		49.50*
Cut bolsters & side frames		47.50*
Angles and splice bars		49.50*
RR. steel car axles		56.50*
RR. couplers and knuckles		49.50*
No. 1 machinery cast	40.00 to	41.00
Cupola cast	39.00 to	40.00
Heavy breakable cast.	35.00 to	36.00
Cast iron brake shoes		41.00†
Cast iron car wheels		47.00†
Malleable	50.00 to	51.00
Stove plate	39.00 to	40.00

Philadelphia

No. 1 hvy. melting	$40.00 to	$41.00
No. 2 hvy. melting	38.00 to	39.00
No. 1 bundles	40.00 to	41.00
No. 2 bundles	38.00 to	39.00
Machine shop turn.	29.00 to	30.00
Mixed bor. and turn.	31.00 to	32.00
Shoveling turnings	33.50 to	34.50
Clean cast chem. borings	34.00 to	34.50
Low phos. punch'gs, plate		45.00*
Low phos. 3 ft and under		45.50*
Low phos. bundles		44.50*
Hvy. trimmings		41.50*
RR. steel wheels		49.50*
RR. spring steel		49.50*
Rails 18 in. and under		52.50*
Cupola cast.	38.00 to	41.00
Heavy breakable cast.	40.00 to	41.00
Cast iron carwheels		47.00†
Malleable		55.00†
Unstripped motor blocks	34.00 to	35.00
Drop broken mach'y cast.	46.00 to	48.00
Charging box cast.	39.00 to	40.00

Cleveland

No. 1 hvy. melting	$40.00 to	$41.00
No. 2 hvy. melting	38.00 to	39.00
No. 1 busheling	40.00 to	41.00
No. 1 bundles	40.00 to	41.00
No. 2 bundles	38.00 to	39.00
Machine shop turn.	26.00 to	27.00
Mixed bor. and turn.	30.00 to	31.00
Shoveling turnings	30.00 to	31.00
Cast iron borings	30.00 to	31.00
Low phos. 2 ft and under		48.00*
No. 1 RR. hvy. melting		45.00*
Rails 3 ft and under		50.00*
Rails 18 in. and under		53.00*
No. 1 machinery cast.	48.50 to	49.50
Cast iron carwheels		47.00†
Stove plate	45.00 to	46.00
Malleable	51.00 to	52.00

Youngstown

No. 1 hvy. melting	$41.00 to	$42.00
No. 2 hvy. melting	39.00 to	40.00
No. 1 bundles	41.00 to	42.00
No. 2 bundles	39.00 to	40.00
Machine shop turn.	27.00 to	28.00
Shoveling turnings	31.00 to	32.00
Cast iron borings	31.00 to	32.00
Low phos. plate		46.50*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

*Scrap at basing point ceiling. Broker's fee not included.

†Scrap at shipping point ceiling. Broker's fee not included.

Buffalo

No. 1 hvy. melting	$37.00 to	$38.00
No. 2 hvy. melting	37.00 to	38.00
No. 1 bushelings	38.00 to	39.00
No. 1 bundles	38.00 to	39.00
No. 2 bundles	37.00 to	38.00
Machine shop turn.	28.00 to	29.00
Mixed bor. and turn.	32.00 to	33.00
Shoveling turnings	32.00 to	33.00
Cast iron borings	32.00 to	33.00
Low phos. plate		45.50*
Scrap rails, random lgth.		47.00*
Rails 2 ft and under		51.00*
RR. steel wheels		50.00*
RR. spring steel		50.00*
RR. couplers and knuckles		50.00*
No. 1 machinery cast.		46.00†
No. 1 cupola cast.	40.00 to	41.00
Small indus. malleable		55.00†

Birmingham

No. 1 hvy. melting		$38.00*
No. 2 hvy. melting		38.00*
No. 1 bundles		39.00*
Electric furnace bundles		41.00*
No. 2 bundles		38.00*
No. 1 busheling		39.00*
Machine shop turn.		29.00*
Shoveling turnings		33.00*
Cast iron borings		33.00*
Bar crops and plate		44.00*
Structural and plate, 2 ft.		44.00*
No. 1 RR. hvy. melting		41.00*
Scrap rails, random lgth.		43.00*
Rerolling rails		48.00*
Rails 2 ft and under		47.00*
Angles & splice bars		46.00*
Std. steel axles		53.00*
No. 1 cupola cast.	44.00 to	45.00
Stove plate	40.00 to	41.00
Cast iron carwheels		47.00†
Charging box cast.	39.00 to	40.00
Heavy breakable	36.00 to	37.00
Drop broken machinery	42.00 to	43.00
Unstripped motor blocks.	35.00 to	36.00

St. Louis

No. 1 hvy. melting		$40.00*
No. 2 hvy. melting		40.00*
No. 2 bundled sheets		40.00*
Machine shop turn.		26.00
Shoveling turnings		28.00
Rails, random lengths		45.00*
Rails 3 ft and under		50.00
Locomotive tires, uncut		48.00
Angles and splice bars		48.00*
Std. steel car axles		55.00*
RR. spring steel		48.00*
Cupola cast.		40.00
Hvy. breakable cast.		38.00
Cast iron brake shoes		38.00
Stove plate		42.00
Cast iron car wheels	45.00 to	46.00
Malleable	45.00 to	50.00
Unstripped motor blocks.		35.00

New York

Brokers' Buying prices per gross ton, on cars:

No. 1 hvy. melting	$33.00 to	$34.00
No. 2 hvy. melting	31.50 to	32.50
No. 2 bundles	31.50 to	32.50
Machine shop turn.	22.00 to	22.50
Mixed bor. and turn.	24.00 to	24.50
Shoveling turnings	24.00 to	24.50
Clean cast chem. borings	30.00 to	30.50
No. 1 machinery cast	42.00 to	43.00
Mixed yard cast.	33.00 to	35.00
Charging box cast.	36.00 to	38.00
Heavy breakable cast.	33.00 to	35.00
Unstrp. motor blocks	29.00 to	30.00

Boston

Brokers' Buying prices per gross ton, on cars:

No. 1 hvy. melting	$30.00 to	$30.50
No. 2 hvy. melting		28.50
No. 1 bundles	28.00 to	30.00
No. 2 bundles	28.00 to	30.00
No. 1 busheling	28.00 to	30.00
Machine shop turn.		13.00
Mixed bor. and turn.		17.00
Shoveling turnings		20.00
Clean cast chem. borings		34.00
Mixed cupola cast.	33.00 to	34.00
Heavy breakable cast.		29.00
Stove plate	29.00 to	31.00

Detroit

Brokers' Buying prices per gross ton, on cars:

No. 1 hvy. melting		$39.50*
No. 2 hvy. melting		36.50
No. 1 bundles, openhearth		40.50*
No. 1 bundles, electric furnace		42.50*
New busheling		40.50*
Machine shop turn.	27.00 to	28.00
Mixed bor. and turn.		32.00
Shoveling turnings		32.00
Cast iron borings		32.00
Low phos. punch'gs, plate		42.50*
No. 1 cupola cast.	46.00 to	47.00
Heavy breakable cast.	40.00 to	42.00
Stove plate		41.00
Automotive cast.		47.00
Cast iron brake shoes		39.00

Cincinnati

No. 1 hvy. melting	$40.50 to	$41.00
No. 2 hvy. melting	39.00 to	41.00
No. 1 bundles	40.50 to	41.00
No. 2 bundles	40.50 to	41.00
Machine shop turn.	28.50 to	29.50
Mixed bor. and turn.	33.50 to	34.50
Shoveling turnings	33.50 to	34.50
Cast iron borings	33.50 to	34.50
Low phos. plate		45.50*
Low phos. 2 ft and under		48.00*
Rails, random lengths		47.00*
Rails, 18 in. and under		53.00*
No. 1 cupola cast.	46.00 to	47.00
Hvy. breakable cast.	39.00 to	40.00
Drop broken cast.	49.00 to	50.00

San Francisco

No. 1 hvy. melting		$34.00*
No. 2 hvy. melting		34.00*
No. 1 bundles		35.00*
No. 2 bundles		29.00
Machine shop turn.		20.00
Elec. fur. 1 ft and under.		41.00*
No. 1 RR. hvy. melting		37.00*
Scrap rails random lgth.		39.00*
No. 1 cupola cast.		42.00

Los Angeles

No. 1 hvy. melting		$34.00*
No. 2 hvy. melting		34.00*
No. 1 bundles		35.00*
No. 2 bundles		29.00
Mach. shop turn.		20.00
Elec. fur. 1 ft and under.		41.00*
No. 1 RR. hvy. melting		37.00*
Scrap rails, random lgth.		39.00*
No. 1 cupola cast.		45.00

Seattle

No. 1 hvy. melting		$34.00*
No. 2 hvy. melting		34.00*
No. 1 bundles		35.00*
No. 2 bundles		29.00
Elec. fur. 1 ft and under.		41.00*
No. 1 RR. hvy. melting		37.00*
No. 1 cupola cast.		36.50
Heavy breakable		32.00

Hamilton, Ont.

No. 1 hvy. melting		$35.00
No. 1 bundles		35.00
No. 2 bundles		34.50
Mechanical bundles		33.00
Mixed steel scrap		31.00
Mixed bor. and turn.		32.00
Rails, remelting		35.00
Rails, rerolling		33.00
Bushelings		30.00
Bush., new fact. prep'd.		32.00
Bush., new fact. unprep'd.		32.00
Short steel turnings		33.00
Cast scrap		50.00

hoops

for milady's crinolines

For several years during the decade of 1860 to 1870, almost 1500 tons of tempered steel wire were used annually for hoop skirts. Ichabod Washburn of Worcester, Mass., invented a feasible method of tempering cheaper grades of cast steel—thus making available hoops at a price which put ballooning skirts within the reach of even the poorest.

Today, steel is required in huge quantities, not for hoop skirts, but for thousands of important civilian and industrial uses—and for the vital defense program as well. Scrap is an indispensable ingredient.

For the purchase or sale of iron or steel scrap . . .

phone or write "Your Chicago Broker"

M.S. KAPLAN COMPANY

231 S. La Salle St., Chicago

Telephone ANdover 3-3900

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Flat-rolled Steel: (cents per pound)	July 22, 1952	July 15, 1952	June 24, 1952	July 24, 1951
Hot-rolled sheets	3.60	3.60	3.60	3.60
Cold-rolled sheets	4.35	4.35	4.35	4.35
Galvanized sheets (10 ga)	4.80	4.80	4.80	4.80
Hot-rolled strip	3.50	3.50	3.50	3.50
Cold-rolled strip	4.75	4.75	4.75	4.75
Plate	3.70	3.70	3.70	3.70
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	36.75	36.75	36.75	36.75
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb.) cokes	$8.70	$8.70	$8.70	$8.70
Tinplate, electro (0.50 lb.)	7.40	7.40	7.40	7.40
Special coated mfg. ternes	7.50	7.50	7.50	7.50
Bars and Shapes: (cents per pound)				
Merchant bars	3.70	3.70	3.70	3.70
Cold finished bars	4.55	4.55	4.55	4.55
Alloy bars	4.30	4.30	4.30	4.30
Structural shapes	3.65	3.65	3.65	3.65
Stainless bars (No. 302)	31.50	31.50	31.50	31.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire (cents per pound)				
Bright wire	4.85	4.85	4.85	4.85
Rails (dollars per 100 lb)				
Heavy rails	$3.60	$3.60	$3.60	$3.60
Light rails	4.00	4.00	4.00	4.00
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$56.00	$56.00	$56.00	$56.00
Slabs, rerolling	56.00	56.00	56.00	56.00
Forging billets	66.00	66.00	66.00	66.00
Alloy blooms, billets, slabs	70.00	70.00	70.00	70.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	4.10	4.10	4.10	4.10
Skelp	3.35	3.35	3.35	3.35

Pig Iron: (per gross ton)	July 22, 1952	July 15, 1952	June 24, 1952	July 24, 1951
Foundry, del'd Phila.	$58.19	$58.19	$58.19	$57.77
Foundry, Valley	52.50	52.50	52.50	52.50
Foundry, Southern, Cin'ti	55.58	55.58	55.58	55.58
Foundry, Birmingham	48.88	48.88	48.88	48.88
Foundry, Chicago†	52.50	52.50	52.50	52.50
Basic, del'd Philadelphia	57.27	57.27	57.27	56.92
Basic, Valley furnace	52.00	52.00	52.00	52.00
Malleable, Chicago†	52.50	52.50	52.50	52.50
Malleable, Valley	52.50	52.50	52.50	52.50
Charcoal, Chicago	70.56	70.56	70.56	70.56
Ferromanganese‡	186.25	186.25	186.25	186.25

†The switching charges for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy pages.

Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$41.75	$39.50	$42.50	$44.00*
No. 1 steel, Phila. area	40.50	40.50	37.50	42.50*
No. 1 steel, Chicago	40.00	38.00	38.50	42.50*
No. 1 bundles, Detroit	41.15*	41.15*	41.15*	41.15*
Low phos. Young'n	46.50*	46.50*	46.50*	46.50*
No. 1 cast, Pittsburgh	42.00	42.00	45.50	49.00†
No. 1 cast, Philadelphia	39.50	38.50	38.50	49.00†
No. 1 cast, Chicago	39.50	39.50	40.50	49.00†

*Basing pt., not including broker's fee.
†Shipping pt., not including broker's fee.

Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75	$14.75	$14.75	$14.75
Foundry coke, prompt	17.75	17.75	17.75	17.75

Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	24.50	24.50	24.50	24.50
Copper, Lake, Conn.	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.215	$1.215	$1.215	$1.06
Zinc, East St. Louis	15.00	15.00	15.00	17.50
Lead, St. Louis	15.80	15.80	15.80	16.80
Aluminum, virgin	19.00	19.00	19.00	19.00
Nickel, electrolytic	59.58	59.58	59.58	59.58
Magnesium, ingot	24.50	24.50	24.50	24.50
Antimony, Laredo, Tex.	39.00	39.00	39.00	42.00

Composite Prices

[Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)]

	Finished Steel Base Price	Pig Iron	Scrap Steel
July 22, 1952	4.131¢ per lb.	$52.77 per gross ton	$40.75 per gross ton
One week ago	4.131¢ per lb.	52.77 per gross ton	39.33 per gross ton
One month ago	4.131¢ per lb.	52.77 per gross ton	39.50 per gross ton
One year ago	4.131¢ per lb.	52.69 per gross ton	43.00 per gross ton

	Finished Steel Base Price High		Finished Steel Base Price Low		Pig Iron High		Pig Iron Low		Scrap Steel High		Scrap Steel Low	
1952	4.131¢	Jan. 1	4.131¢	Jan. 1	$52.77	May 2	$52.72	Jan. 1	$42.00	Jan. 1	$39.17	July 1
1951	4.131¢	Jan. 2	4.131¢	Jan. 2	52.72	Oct. 9	52.69	Jan. 2	47.75	Jan. 30	42.00	Oct. 23
1950	4.131¢	Dec. 1	3.837¢	Jan. 3	52.69	Dec. 12	45.88	Jan. 3	45.13	Dec. 19	26.25	Jan. 3
1949	3.837¢	Dec. 27	3.705¢	May 3	46.87	Jan. 18	45.88	Sept. 6	43.00	Jan. 4	19.33	June 28
1948	3.721¢	July 27	3.193¢	Jan. 1	46.91	Oct. 12	39.58	Jan. 6	43.16	July 27	39.75	Mar. 9
1947	3.193¢	July 29	2.848¢	Jan. 1	37.98	Dec. 30	30.14	Jan. 7	42.58	Oct. 28	29.50	May 20
1946	2.848¢	Dec. 31	2.464¢	Jan. 1	30.14	Dec. 10	25.37	Jan. 1	31.17	Dec. 24	19.17	Jan. 1
1945	2.464¢	May 29	2.396¢	Jan. 1	25.37	Oct. 23	23.61	Jan. 2	19.17	Jan. 2	18.92	May 22
1944	2.396¢		2.396¢		$23.61		$23.61		19.17	Jan. 11	15.76	Oct. 24
1943	2.396¢		2.396¢		23.61		23.61		$19.17		$19.17	
1942	2.396¢		2.396¢		23.61		23.61		19.17		19.17	
1941	2.396¢		2.396¢		$23.61	Mar. 20	$23.45	Jan. 2	$22.00	Jan. 7	$18.92	May 22
1940	2.30467¢	Jan. 2	2.24107¢	Apr. 16	23.45	Dec. 23	22.61	Jan. 2	21.83	Dec. 30	16.04	Apr. 9
1939	2.35367¢	Jan. 3	2.27207¢	May 16	22.61	Sept. 19	20.61	Sept. 12	22.50	Oct. 3	14.08	May 16
1938	2.58414¢	Jan. 4	2.27207¢	Oct. 18	23.25	June 21	19.61	July 6	15.00	Nov. 22	11.00	June 7
1937	2.58414¢	Mar. 9	2.32263¢	Jan. 4	32.25	Mar. 9	20.25	Feb. 16	21.92	Mar. 30	12.67	June 9
1936	2.32263¢	Dec. 28	2.05200¢	Mar. 10	19.74	Nov. 24	18.73	Aug. 11	17.75	Dec. 21	12.67	June 8
1929	2.31773¢	May 28	2.26498¢	Oct. 29	18.71	May 14	18.21	Dec. 17	17.58	Jan. 29	14.08	Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Look into this to cut parts cost without cutting quality

The object of this inspector's interest at Barium's Geometric Stamping Company might prove interesting, and profitable, to you.

He's examining a metal part (a truck radiator frame) that's lighter, smarter and *lower-cost* because Geometric has years of know-how on precision stampings and assemblies.

It may pay you to investigate what this Barium subsidiary can do for you by stamping, if you use medium and heavy metal parts.

If stamped parts can't solve your particular steel need, you'll probably find the answer elsewhere in the Barium family. Barium's fifteen member companies, working in steel, supply industry with steel in many forms, and are ready to work as a self-contained unit to speed urgently needed orders.

Address your steel problem to Barium Steel Corporation, 25 Broad Street, New York City.

BOLTS — Bayonne Bolt Corporation

STEEL PLATE — Central Iron and Steel Company

PIG IRON — Chester Blast Furnace

CRANES AND HOISTS — Clyde Iron Works, Inc.

SPRINGS — Cuyahoga Spring Company

BOLTS AND NUTS — Erie Bolt and Nut Company

METAL STAMPINGS — Geometric Stamping Company

DROP FORGINGS — Globe Forge, Inc.

HEAVY FLAT DIE FORGINGS — Industrial Forge and Steel, Inc.

AIRCRAFT ENGINES AND PRECISION ASSEMBLIES — Jacobs Aircraft Engine Company

MARINE DIESEL AND GASOLINE ENGINES — Kermath Manufacturing Company, Kermath Limited (Canada)

STRUCTURAL SHAPES AND STEEL FABRICATIONS — Phoenix Bridge Company, Phoenix Iron and Steel Company

BARGES AND TUGS — Wiley Manufacturing Company

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PIL-ING	SHAPES STRUCTURALS		STRIP			
		Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Steel Sheet	Carbon	Hi Str. Low Alloy	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy
EAST	Bethlehem, Pa.					70.00 *B3*			3.70 *B3*	5.50 *B3*				
	Buffalo, N. Y.			56.00 *B3*	66.00 *B3, R3*	70.00 *B3, R3*		4.45 *B3*	3.70 *B3*	5.50 *B3*	3.50 *B3, R3*	4.65 *B3*	4.95 *B3*	6.00 *B3*
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.				73.00 *A2*	77.00 *A2*					3.90 *A2*		5.55 *A2*	
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.			56.00 *B3*	66.00 *B3*	70.00 *B3*			3.70 *B3*	5.50 *B3*	3.50 *B3*			
	Newark, N. J.													
	New Haven, Conn.											5.15 *A5* 5.85 *D1*		
	Phoenixville, Pa.								5.90 *P2*					
	Putnam, Conn.													
	Sparrows Pt., Md.										3.50 *B3*	4.65 *B3*	4.95 *A5, B3*	6.00 *B3*
	Worcester, Mass.													
	Trenton, N. J.											6.00 *R4*		
MIDDLE WEST	Alton, Ill.										3.95 *L1*			
	Ashland, Ky.										3.50 *A7*			
	Canton-Massillon, Ohio				66.00 *R3*	70.00 *R3* 66.00 *T5*								
	Chicago, Ill.			56.00 *U1*	66.00 *U1, R3,W8*	70.00 *U1, R3,W8*		4.45 *U1*	3.65 *U1, W8*	5.50 *U1*	3.50 *A1, W8*	4.90 *A1, I3*		
	Cleveland, Ohio				66.00 *R3*							4.65 *A5,J3*		6.55 *A5* 6.70 *J3*
	Detroit, Mich.		54.00 *R5*		69.00 *R5*	73.00 *R5*					4.40 *M2* 3.80 *G3*	4.85 *G3* 5.45 *M2* 5.60 *R5,D1, D2*	5.95 *G3*	
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana			56.00 *U1*	66.00 *U1*	70.00 *U1, Y1*		4.45 *I3*	3.65 *U1, I3*	5.50 *U1, I3* 6.00 *Y1*	3.50 *U1, Y1,I3*	4.90 *I3*	5.30 *U1, I3* 5.80 *Y1*	
	Granite City, Ill.													
	Kokomo, Ind.													
	Middletown Ohio											4.65 *A7*		
	Niles, Ohio Sharon, Pa.										4.00 *S1*	5.35 *S1*	5.40 *S1*	6.55 *S1*
	Pittsburgh, Pa.	52.00 *U1*	54.00 *U1, C11*	56.00 *U1*	66.00 *U1*	70.00 *U1, C11*	3.35 *U1* 3.45 *J3*	4.45 *U1*	3.65 *U1, J3*	5.50 *U1, J3*	4.00 *S9,S7* 3.75 *A3* 3.50 *J3,A7*	4.65 *J3,A7* 5.00 *A3* 5.35 *B4,S7*		
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.								3.90 *W3*		3.60 *W3*	4.65 *W3,F3*	5.75 *W3*	7.20 *W3*
	Youngstown, Ohio					70.00 *Y1, C10*	3.35 *U1, R3*			6.00 *Y1*	3.50 *U1, R3, Y1*	4.65 *R3, Y1* 5.25 *C5,T4* 5.35 *B4*	5.30 *U1, R3* 5.80 *Y1*	6.55 *R3* 7.05 *Y1*
WEST	Fontana, Cal.	79.00 *K1*	80.00 *K1*	75.00 *K1*	85.00 *K1*	89.00 *K1*			4.25 *K1*	6.10 *K1*	4.75 *K1*	6.30 *K1*	6.20 *K1*	6.95 *K1*
	Geneva, Utah				66.00 *C7*				3.65 *C7*	5.50 *C7*				
	Kansas City, Mo.								4.25 *S2*		4.10 *S2*			
	Los Angeles, Calif.				85.00 *B2*	90.00 *B2*			4.25 *B2, C7*	6.05 *B2*	4.25 *B2,C7*	6.40 *C1*	6.05 *B2*	
	Minnequa, Colo.								4.10 *C6*		4.55 *C6*			
	San Francisco, Cal. Niles, Cal.				85.00 *B2*				4.20 *B2* 4.56 *P9*	6.00 *B2*	4.25 *C7,B2*		6.05 *B2*	
	Seattle, Wash.	73.00 *S11*			85.00 *B2*				4.30 *B2*	6.10 *B2*	4.50 *B2*		6.30 *B2*	
SOUTH	Atlanta, Ga.										4.05 *A8*			
	Birmingham, Ala. Alabama City, Ala.			56.00 *T2*	66.00 *T2*				3.65 *R3,T2*	5.50 *T2*	3.50 *R3,T2*		5.30 *T2*	
	Houston, Texas		62.00 *S2*		74.00 *S2*	78.00 *S2*			4.05 *S2*		3.90 *S2*			

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE	
	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Terne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.	
													Bethlehem, Pa.
B3	4.35 *B3*				5.40 *B3*	6.55 *B3*			4.10 *W6*				Buffalo, N. Y.
										† Special coated mfg ternes deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb, deduct $2.20 from 1.25-lb coke base box. * COKES: 1.50-lb, add 25¢. ELECTRO: 0.50-lb, add 25¢; 0.75-lb, add 65¢.			Claymont, Del.
													Coatesville, Pa.
A2					5.65 *A2*								Conshohocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
									4.10 *B3*				Johnstown, Pa.
													Newark, N. J.
													New Haven, Conn.
													Phoenixville, Pa.
													Putnam, Conn.
B3	4.35 *B3*	4.80 *B3*			5.40 *B3*	6.55 *B3*	6.75 *B3*		4.20 *B3*	$8.55 *B3*	$7.25 *B3*		Sparrows Pt., Md.
									4.40 *A5*				Worcester, Mass.
									4.20 *R4*				Trenton, N. J.
									4.40 *L1*				Alton, Ill.
A7		4.80 *A7*	4.65 *A7*										Ashland, Ky.
		4.80 *R3*											Canton-Massillon, Ohio
					5.40 *U1*				4.10 *A5,R3, N4*				Chicago, Ill.
R3,J3	4.35 *R3,J3*		4.65 *R3*		5.40 *R3,J3*	6.55 *R3,J3*			4.10 *A5*				Cleveland, Ohio
G3	4.55 *G3*				5.95 *G3*	7.10 *G3*							Detroit, Mich.
													Duluth, Minn.
U1, J3	4.35 *U1, Y1,I3*	4.80 *U1.I3*	4.65 *U1,I3*	5.20 *U1*	5.40 *U1,I3* 5.90 *Y1*	6.55 *U1,I3* 7.05 *Y1*		5.40 *I3*	4.10 *Y1*	$8.45 *I3, U1, Y1*	$7.15 *U1,I3*	5.85 *U1* 5.30 *Y1*	Gary, Ind. Harbor, Indiana
G2	5.05 *G2*	5.50 *G2*	5.35 *G2*								$7.35 *G2*	6.05 *G2*	Granite City, Ill.
		5.20 *C9*											Kokomo, Ind.
	4.35 *A7*		4.65 *A7*	5.20 *A7*									Middletown, Ohio
N3 S1		6.00 *N3*		6.00 *N3*	5.40 *S1*								Niles, Ohio Sharon, Pa.
U1, A7 A3	4.35 *U1, J3,A7*	4.80 *U1*	4.65 *U1*		5.40 *U1,J3*	6.55 *U1,J3*	7.20 *U1*		4.10 *A5* 4.41 *P6*	$8.45 *U1,J3*	$7.15 *U1,J3*	5.85 *U1*	Pittsburgh, Pa.
									4.30 *P7*				Portsmouth, Ohio
W3,W5	5.35 *F3* 4.35*W3,W5*	4.80*W3,W5*		5.20*W3,W5*	5.75 *W3*	6.90 *W3*				$8.45*W3,W5*	$7.15*W3,W5*	6.15 *W5* 5.85 *F3*	Weirton, Wheeling, Follansbee, W. Va.
U1, Y1	4.35 *R3, Y1*	5.50 *R1*	4.65 *Y1*	6.05 *E2*	5.40 *U1,R3* 5.90 *Y1*	6.55 *R3* 7.05 *Y1*		6.05 *R1,E2*	4.10 *Y1*	$8.45 *R3*	$7.15 *R3*		Youngstown, Ohio
K1	5.30 *K1*				6.35 *K1*	7.50 *K1*			4.90 *K1*				Fontana, Cal.
C7													Geneva, Utah
													Kansas City, Mo.
C7		5.55 *C7*						5.40 *C7*	4.90 *B2,C7*	$9.20 *C7*	$7.90 *C7*		Los Angeles, Cal.
									4.35 *C6*				Minnequa, Colo.
C7	5.30 *C7*	5.55 *C7*											San Francisco, Cal. Niles, Cal.
													Seattle, Wash.
													Atlanta, Ga.
R3,T2	4.35 *T2*	4.80 *R3,T2*			5.40 *T2*			4.75 *R3*	4.10 *R3,T2*	$8.55 *T2*	$7.25 *T2*		Birmingham, Ala. Alabama City, Ala.
									4.50 *S2*				Houston, Texas

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfg'r's. Bright
EAST	Bethlehem, Pa.				4.30 *B3*	5.40 *B3*	5.55 *B3*					
	Buffalo, N. Y.	3.70 *B3,R3*	3.70 *B3,R3*	4.60 *B5*	4.40 *B3,R3*	5.40 *B3*	5.55 *B3*	3.70 *B3*				4.85 *W6*
	Claymont, Del.							4.15 *C4*		4.85 *C4*		
	Coatesville, Pa.							4.15 *L4*		5.25 *L4*		
	Conshohocken, Pa.							4.15 *A2*	4.75 *A2*	5.05 *A2*	5.90 *A2*	
	Harrisburg, Pa.							6.30 *C3*	6.30 *C3*			
	Hartford, Conn.			5.10 *R3*		5.85 *R3*						
	Johnstown, Pa.	3.70 *B3*	3.70 *B3*		4.20 *B3*		5.55 *B3*	3.70 *B3*		4.75 *B3*	5.65 *B3*	4.85 *B3*
	Newark, N. J.			5.80 *W10*		5.75 *W10*						
	New Haven, Conn.											
	Phoenixville, Pa.											
	Putnam, Conn.			5.10 *W10*								
	Sparrows Point, Md.		3.70 *B3*					3.70 *B3*		4.75 *B3*	5.65 *B3*	4.95 *B3*
	Worcester, Mass.					5.75 *A5*						5.15 *A5,W*
	Trenton, N. J.											
MIDDLE WEST	Alton Ill.	4.15 *L1*										5.05 *L1*
	Ashland, Ky.							3.70 *A7*				
	Canton-Massillon	3.70 *R3*		4.55 *R3,R2*	3.95 *T5* 4.30 *R3*	4.90 *T5* 5.40 *R3,R2*						
	Chicago, Ill.	3.70 *U1,R3,* *W8*	3.70 *R3*	4.55 *A5,B5,* *W8,W1*	4.30 *U1,R3* *W8*	5.40 *R3,W8* *W10,B5,L2* 5.45 *A5*		3.70 *U1,W8*	4.75 *U1*	4.75 *U1*	5.65 *U1*	5.10 *W7* 4.85 *R3,* *K2,N4*
	Cleveland, Ohio	3.70 *R3*	3.70 *R3*	4.55 *A5,C13*		5.45 *A5*	5.55 *R3,J3*	3.70 *R3,J3*	4.75 *J3*		5.65 *R3,J3*	4.85 *A5,C*
	Detroit, Mich.	3.85 *R5*		4.70 *P8,R5* 4.80 *P3*	4.45 *R5* 4.65 *G3*	5.50 *R5* 5.55 *P8* 5.60 *P3*						
	Duluth, Minn.											4.85 *A5*
	Gary, Ind. Harbor, Indiana	3.70 *U1, Y1,* *I3*	3.70 *U1,I3,* *Y1*	4.55 *R3,M5,* *L2*	4.30 *U1,I3,* *Y1*	5.40 *R3,M5,* *L2*	5.55 *U1,I3* 6.05 *Y1*	3.70 *U1,I3,* *Y1*	4.75 *I3*	4.75 *U1*	5.65 *U1,I3* 6.15 *Y1*	5.10 *M4*
	Granite City, Ill.							4.40 *G2*				
	Kokomo, Ind.											4.95 *C9*
	Middletown, Ohio											
	Niles, Ohio Sharon, Pa.							3.95 *S1*		5.20 *S1*	5.70 *S1*	
	Pittsburgh, Pa.	3.70 *U1,J3*	3.70 *U1,J3*	4.55 *R3,A5,* *J3,S8,W10,* *C8*	4.30 *U1,C11*	5.40 *C11,S8,* *W10,C8,A5*	5.55 *U1,J3*	3.70 *U1,J3*	4.75 *U1*	4.75 *U1*	5.65 *U1,J3*	4.85 *A5,J* 5.23 *P6*
	Portsmouth, Ohio											5.25 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	3.85 *W3*						4.00 *W3,W5*				
	Youngstown, Ohio	3.70 *U1,R3,* *Y1*	3.70 *U1,R3,* *Y1*	4.55 *Y1,F2*	4.30 *U1, Y1,* *C10*	5.40 *Y1,C10,* *F2*	5.55 *U1* 6.05 *Y1*	3.70 *U1,R3,* *Y1*			5.65 *R3* 6.15 *Y1*	4.85 *Y1*
WEST	Fontana, Cal.	4.40 *K1*	4.40 *K1*		5.35 *K1*		6.60 *K1*	4.30 *K1*		5.70 *K1*	6.25 *K1*	
	Geneva, Utah							3.70 *C7*			5.65 *C7*	
	Kansas City, Mo.	4.30 *S2*	4.30 *S2*		4.90 *S2*							5.45 *S2*
	Los Angeles, Cal.	4.40 *C7,B2*	4.40 *C7,B2*		5.35 *B2*		6.25 *B2*					5.80 *C7,B2*
	Minnequa, Colo.	4.15 *C6*	4.50 *C6*					4.50 *C6*				5.10 *C6*
	San Francisco, Cal. Niles Cal.	4.45 *B2* 4.40 *C7* 4.65 *P9*	4.45 *B2* 4.40 *C7* 4.65 *P9*				6.30 *B2*					5.80 *C7*
	Seattle, Wash.	4.45 *B2*	4.45 *B2*				6.30 *B2*	4.60 *B2*			6.55 *B2*	
SOUTH	Atlanta, Ga.	4.25 *A8*	4.25 *A8*									5.10 *A8*
	Birmingham, Ala. Alabama City, Ala.	3.70 *R3,T2*	3.70 *R3,T2*				5.55 *T2*	3.70 *R3,T2*			5.85 *T2*	4.85 *R3,T2*
	Houston, Tex. ▶▶	4.10 *S2*	4.10 *S2*		4.70 *S2*			4.10 *S2*				5.25 *S2*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin Inc., Harvey, Ill.

C1 California Cold Rolled Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Steel Corp., Claymont, Del.
C5 Cold Metal Products Co., Youngstown
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia-Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Glassport, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago

K1 Kaiser Corp., Oakland, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Lacledе Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Co., Pittsburgh
N3 Niles Rolling Mills Co., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.

O1 Oliver Iron & Steel Co., Pittsburgh

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div. Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co. (John A.), Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sloss Sheffield Steel & Iron Co., Birmingham
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Sweet's Steel Co., Williamsport, Pa.
S11 Seidelhuber Steel Rolling Mills, Seattle

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal, Iron & R. R. Co., Birmingham
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Steel Co., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.

U1 United States Steel Co., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Co., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh

Y1 Youngstown Sheet & Tube Co., Youngstown

Steel Prices

Base price, f.o.b., dollars per 100 lb.

WAREHOUSES		Sheets			Strip		Plates	Shapes	Bars		Alloy Bars			
Cities	Delivery Charge*	Hot-Rolled	Cold-Rolled (15 gge)	Galvanized (10 gge)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4615 As rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As Rolled	Cold-Drawn A 4140 Annealed
Baltimore	$.20	5.54–6.44	6.84–7.05	8.07	6.07	.....	6.17	6.17	6.05	6.67	.....	.....	.....	.....
Birmingham	.15	5.59	6.37	7.20–7.35[1]	5.54	.....	5.85	5.70	5.52	7.60	.....	.....	.....	.....
Boston	.20	6.25	7.03	8.24–8.33	6.20	7.74–8.70	6.38–6.63	6.25	6.10–6.14	6.61–6.92	10.25–10.30	10.55–10.63	11.95	12.15–12.28
Buffalo	.20	5.50–5.54	6.28–6.32	8.11–8.20	5.86	.....	5.80–5.98	5.80	5.52–5.82	6.18–6.45	10.15	10.45–10.52	11.80	12.10–12.17
Chicago	.20	5.54	6.32	7.70	5.49	.....	5.65–5.70	5.65	5.47	6.05–6.30	.....	10.10	.....	11.75
Cincinnati	.15	5.87	6.39	8.17	5.79	.....	6.17	6.12	5.77	6.66	.....	10.52	.....	12.22
Cleveland	.20	5.52–5.54	6.32	7.81–7.96	5.65–5.88	.....	5.82–5.83	5.95–6.16	5.54–5.61	6.15–6.40	.....	10.21	.....	11.86
Detroit	.20	5.73–5.74	6.49	8.19–8.34	5.78	.....	6.04–6.17	6.12	5.76	6.68	.....	10.37	.....	12.12
Houston	.20	6.35–6.58	7.37–8.09	8.57	6.15	.....	6.39–6.42	6.32–6.35	6.38	8.38–8.63	10.95	11.12–11.25	11.40	12.62–12.90
Indianapolis	del'd.	5.94	6.72	8.25	5.89	.....	6.10	6.05	5.87	6.80	.....	10.50	.....	.....
Kansas City	.20	6.22–6.40	7.64–7.68	8.66–8.70	6.10–6.90	7.81	6.38–6.74	6.43–6.48	6.20–6.77	7.01–7.22	10.00	10.10	11.50	11.80
Los Angeles	.20	6.30	8.10–8.45	9.30–9.35	6.40	10.45	6.30	6.30	6.25–6.35	8.15	11.30	11.30	13.05	13.50
Memphis	.10	6.25	7.03	7.51	6.20	.....	6.36	6.36–6.61	6.33–6.57	7.11	.....	.....	.....	.....
Milwaukee	.20	5.71	6.48	7.86–7.87	5.66	.....	5.81–5.87	5.82	5.64	6.31–6.61	.....	10.17	.....	.....
New Orleans	.15	5.98	7.01	8.26	5.93	.....	6.09	6.09	5.91	7.02	.....	.....	.....	.....
New York	.30	6.09–6.52	6.90–7.08	8.12–8.33	6.36–7.19	7.67	6.47–6.88	6.39–6.40	6.22–6.42	7.03–7.58	10.45	10.49–10.75	12.10	12.14–12.40
Norfolk	.20	6.68	.....	.....	6.33	.....	6.20	6.20	5.95	7.30	.....	.....	.....	.....
Philadelphia	.25	5.84–6.07	6.80–7.22	8.00–8.38	6.04–6.08	7.15	6.05–6.19	5.86–6.09	6.14–6.27	6.96–7.16	9.82–10.17	10.24–10.47	11.82	11.89–12.12
Pittsburgh	.20	5.54	6.32	7.70–8.10	5.59–5.84	.....	5.65–5.70	5.65	5.47	6.15–6.40	.....	10.10	.....	11.75
Portland	.20	7.25	8.64–9.00	9.10–9.25	7.30	.....	6.80	7.88	7.00	8.65	.....	.....	.....	.....
Salt Lake City	.20	7.95	.....	9.80–10.35	8.00	.....	7.45	7.60	7.95	.....	.....	.....	.....	.....
San Francisco	.15	6.51–6.65	7.86–8.23	9.10	6.42	10.45	6.40–6.43	6.30	6.32–6.34	8.15–8.20	11.30	11.30	13.05	13.50
Seattle	.20	6.14–6.81	8.38–8.44	8.93	7.05–7.75	.....	6.71–6.90	6.32–6.57	6.50–6.80	8.89–8.93	.....	.....	.....	.....
St. Louis	.20	5.84	6.62–7.15	8.00	5.79	7.66–8.15	6.05–6.10	6.05–6.22	5.77–5.80	6.45–6.70	10.08	10.40	11.73	12.05
St. Paul	.15	6.14	6.92	8.45	6.09	.....	6.25	6.25	6.07	6.75	.....	.....	.....	.....

* Metropolitan area delivery.

BASE QUANTITIES (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

EXCEPTIONS: (1) 500 to 1499 lb.

STAINLESS STEELS

Base price, cents per lb, f.o.b. mill.

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	14.25	15.25	16.75	16.25	34.75	20.00	21.75	12.75	14.75	13.00
Slabs, billets, rerolling	18.50	20.00	22.00	21.00	32.25	26.25	28.50	16.50	20.00	16.75
Forg. discs, die blocks, rings	34.00	34.25	36.75	35.75	53.00	40.25	44.75	28.00	28.50	28.50
Billets, forging	26.25	26.50	28.50	27.75	41.50	31.25	35.00	21.50	22.00	22.00
Bars, wires, structurals	31.25	31.50	34.00	33.00	49.25	37.00	41.50	25.75	26.25	26.25
Plates	33.00	33.25	35.25	35.25	52.00	40.75	45.25	27.00	27.50	27.50
Sheets	41.00	41.25	43.25	43.25	57.00	49.25	53.75	36.50	37.00	39.00
Strip, hot-rolled	26.50	28.25	32.50	30.25	48.75	37.00	41.25	23.50	30.25	24.00
Strip, cold-rolled	34.00	36.75	40.25	38.75	59.00	48.25	52.25	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—*Sheets*: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; McKeesport, Pa., *U1*; Washington, Pa., *W2*; (type 316 add 4.5¢) *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*; Lockport, N. Y., *R4*.

Strip: Midland, Pa., *C11*; Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; (type 316 add 4.5¢); W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Middletown, O., *A7*; Harrison, N. J., *D3*; Youngstown, *C5*; Lockport, N. Y., *S4*; Sharon, Pa., *S1* (type 301 add ¼¢); Butler, Pa., *A7*; Wallingford, Conn., *W1*.

Bars: Baltimore, *A7*; Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A6*; Lockport, N. Y., *S4*; Canton, O., *T5*; Ft. Wayne, *J4*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*.

Plates: Brackenridge, Pa., *A3* (type 416 add ½¢); Butler, Pa., *A7*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Lockport, N. Y., *S4*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*.

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Ferndale, Mich., *A3*; Washington, Pa., *J2*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*.

ALLEGHENY LUDLUM—Slightly higher on Type 301; slightly lower on others in 300 series.

WASHINGTON STEEL—Slightly lower on 300 series except where noted.

PIPE AND TUBING

Base discounts, f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS					
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½-3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	34.0	12.0	37.0	16.0	39.0	19.5	40.0	20.0	40.5	21.0	41.0	21.5	41.5	22.0	....	....	....	....	....	....
Youngstown *R3*	36.0	14.0	39.0	18.0	41.5	21.5	42.9	22.0	42.5	23.0	43.0	23.5	43.5	24.0	....	....	....	....	....	....
Oakland *K1*	25.0	3.0	28.0	7.0	30.5	10.5	31.0	11.0	31.5	12.0	32.0	12.5	32.5	13.0	....	....	....	....	....	....
Pittsburgh *J3*	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.5	8.0	32.5	11.5	34.5	13.5
Pittsburgh *N2*	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
Alton, Ill. *L1*	35.0	13.0	38.0	17.0	40.5	20.5	41.0	21.0	41.5	22.0	42.0	22.5	42.5	23.0	....	....	....	....	....	....
Sharon *M3*	36.0	13.0	39.0	17.0	41.5	20.0	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.0	....	....	....	....	....	....
Pittsburgh *N1*	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	....	32.5	....	34.5	....
Wheeling *W5*	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	....	....	....	....	....	....
Wheatland *W4*	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	....	....	....	....	....	....
Youngstown *Y1*	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
Indiana Harbor *Y1*	35.0	13.0	38.0	17.0	40.5	20.5	41.0	21.0	41.5	22.0	42.0	22.5	42.5	23.0	....	....	....	....	....	....
Lorain, *N2*	36.0	19.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
EXTRA STRONG PLAIN ENDS																				
Sparrows Pt. *B3*	33.5	13.0	37.5	17.0	39.5	20.5	40.0	21.0	40.5	22.0	41.0	22.5	41.5	23.0	....	....	....	....	....	....
Youngstown *R3*	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	....	....	....	....	....	....
Oakland *K1*	24.5	4.0	28.5	8.0	30.5	11.5	31.0	12.0	31.5	13.0	32.0	13.5	32.5	14.0	....	....	....	....	....	....
Pittsburgh *J3*	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.0	7.5	33.0	12.0	36.5	15.5
Pittsburgh *N2*	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0	36.5	17.5
Alton, Ill. *L1*	32.5	12.0	36.5	16.0	38.5	19.5	39.0	20.0	39.5	21.0	40.0	21.5	40.5	22.0	....	....	....	....	....	....
Sharon *M3*	35.5	14.0	39.5	18.0	41.5	21.0	42.0	21.5	42.5	22.0	43.0	22.5	43.5	23.0	....	....	....	....	....	....
Pittsburgh *N1*	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	....	33.0	....	36.5	....
Wheeling *W5*	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	....	....	....	....	....	....
Wheatland *W4*	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	....	....	....	....	....	....
Youngstown *Y1*	35.5	15.0	39.5	19.0	41.0	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	26.0	29.0	10.0	33.0	14.0	36.5	17.5
Indiana Harbor *Y1*	34.5	14.0	38.5	18.0	40.5	21.0	41.0	22.0	41.5	23.0	42.0	23.5	42.5	24.0	....	....	....	....	....	....
Lorain, *N2*	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0	36.5	17.5

Galvanized discounts based on zinc, at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢.

Threads only, buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3½ pts. higher discount. Buttweld jobbers' discount, 5 pct. East St. Louis zinc price now 15.0¢.

COKE

Furnace, beehive (f.o.b. oven)	Net-Ton
Connellsville, Pa.	$14.50 to $15.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$17.50 to $18.00
Foundry, oven coke	
Buffalo, del'd	$26.58
Chicago, f.o.b.	23.00
Detroit, f.o.b.	24.00
New England, del'd	24.80
Seaboard, N. J., f.o.b.	22.75
Philadelphia, f.o.b.	22.70
Swedeland, Pa., f.o.b.	22.60
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	23.50
Cleveland, del'd	25.72
Cincinnati, del'd	25.06
St. Paul, f.o.b.	22.50
St. Louis	25.40
Birmingham, del'd	21.69
Neville Island	23.00

ELECTRICAL SHEETS

22 Ga. H-R cut length F.o.b. Mill Cents Per Lb.	Armature	Elec.	Meter	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech Bottom *W5*	....	7.25	8.50	9.30	9.85	10.40	11.10
Brackenridge *A3*	....	7.25	8.50	9.30	9.85	....	....
Granite City *G2*	....	7.95	9.20	....	....	....	....
Ind. Harbor *I3*	6.75	7.25	....	....	....	....	....
Mansfield *E2*	7.25	7.75	9.00	9.80	....	....	....
Niles, O. *N3*	7.05	7.55	....	....	....	....	....
Vandergrift *U1*	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Warren, O. *R3*	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Zanesville *A7*	6.75	7.25	8.50	9.30	9.85	10.40	11.10

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Bl. Furnace Silvery	Low Phos. Charcoal
Bethlehem *B3*	54.00	54.50	55.00	55.50	....	....	....
Birmingham *R3*	48.38	48.88	....	....	....	....	....
Birmingham *W9*	48.38	48.88	....	....	....	....	....
Birmingham *S5*	48.38	48.88	....	....	....	....	....
Buffalo *R3*	52.00	52.50	53.00	....	....	....	....
Buffalo *H1*	52.00	52.50	53.00	....	....	63.75	....
Chicago *I4*	52.00	52.50	52.50	53.00	....	....	....
Cleveland *A5*	52.00	52.50	52.50	53.00	57.00	....	....
Cleveland *R3*	52.00	52.50	52.50	....	....	....	....
Daingerfield, Tex. *L3*	48.00	48.50	48.50	....	....	....	....
Duluth *I4*	52.00	52.50	52.50	53.00	....	....	....
Erie *I4*	52.00	52.50	52.50	53.00	....	....	....
Everett, Mass. *M6*	....	59.75	60.25	....	....	....	....
Fontana *K1*	58.00	58.50	....	....	....	....	....
Geneva, Utah *U1, Y1*	52.00	52.50	52.50	53.00	....	....	....
Granite City, Ill. *K3*	53.90	54.40	54.90	....	....	....	....
Hubbard, Ohio *Y1*	52.00	52.50	52.50	....	....	....	....
Ironton, Utah *C7*	52.00	52.50	....	....	....	....	....
Jackson, Ohio *J1,G1*	....	....	....	....	....	62.50	....
Lyle, Tenn. *T3*	....	....	....	....	....	....	66.00
Monessen *P6*	54.00	....	....	....	....	....	....
Neville Island *P4*	52.00	52.50	52.50	53.00	....	....	....
Pittsburgh *U1*	52.00	....	....	53.00	....	....	....
Sharpsville *S3*	52.00	52.50	52.50	53.00	....	....	....
Steelton *B3*	54.00	54.50	55.00	55.50	60.00	....	....
Swedeland *A2*	56.00	56.50	57.00	57.50	....	....	....
Toledo *I4*	52.00	52.50	52.50	53.00	....	....	....
Troy, N. Y. *R3*	54.00	54.50	55.00	....	60.00	....	....
Youngstown *Y1*	52.00	52.50	52.50	53.00	....	....	....
N. Tonawanda, N. Y. *T1*	....	52.50	53.00	....	....	....	....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base, (1.75 to 2.25 pct, except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 pct and over. Silvery Iron: Add $1.50 per net ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size		Seamless		Elec. Weld	
	OD-In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox	2	13	22.67	26.66	21.99	25.86
	2½	12	30.48	35.84	29.57	34.76
	3	12	33.90	39.90	32.89	38.70
	3½	11	42.37	49.89	41.10	48.39
	4	10	52.60	61.88	51.02	60.02
National Tube	2	13	21.62	26.48	....	....
	2½	12	29.65	36.32	....	....
	3	12	34.00	41.64	....	....
	3½	11	40.34	49.41	....	....
	4	10	51.21	62.72	....	....
Pittsburgh Steel	2	13	....	27.00	....	....
	2½	12	30.49	37.15	....	....
	3	12	34.95	42.50	....	....
	3½	11	41.48	50.54	....	....
	4	10	52.65	64.16	....	....

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	$105.30 to $108.00
6 to 24-in., del'd N.Y.	108.50 to 109.50
6 to 24-in., Birmingham	91.50 to 94.00

6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipment less .....$123.00 to $130.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

C-R SPRING STEEL

Cents Per Lb. F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Bridgeport, Conn. *S7*	5.35	6.80	7.40	9.35	11.60
Carnegie, Pa. *S9*	....	6.80	7.40	9.35	11.60
Cleveland *A5*	4.65	6.45	7.40	9.35	11.60
Detroit *D1*	5.60	6.65	7.25	....	....
New Castle, Pa. *B4*	5.35	6.80	7.40	9.35	....
New Haven, Conn. *D1*	5.85	6.75	7.35	....	....
Sharon, Pa. *S1*	5.35	6.80	7.40	9.35	11.60
Weirton, W. Va. *W3*	5.35	6.80	7.40	9.35	11.60
Worcester, Mass. *A5*	4.95	6.75	7.70	9.65	11.95
Youngstown *C5*	....	6.80	7.40	9.35	11.60

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Base Col.	Woven Wire Fence 9-15½ ga. Base Col.	Fence Posts Base Col.	Single Loop Bale Ties Base Col.	Twisted Barbless Wire Base Col.	Cal. Barbed Wire Base Col.	Merch. Wire Ann'ld Merch. Wire* ¢/lb.	¢/lb.
Alabama City *R3*	118	126	....	123	....	136	5.70	5.95
Aliquippa, Pa. *J3*	118	132	....	....	136	140	5.70	6.15
Atlanta *A8*	121	133	....	126	126	143	5.95	6.40
Bartonville *K2*	118	130	....	123	143	143	5.70	6.15
Buffalo *W6*	....	....	....	....	....	....	4.85	....
Cleveland *A6*	125	....	....	....	....	....	....	....
Cleveland *A5*	....	....	....	....	....	....	5.70	6.10
Crawfrdsvl. *M4*	....	132	....	....	....	....	145	5.95
Donora, Pa. *A5*	118	130	....	123	140	140	5.70	6.15
Duluth *A5*	118	130	....	123	140	140	5.70	6.15
Fairfield, Ala. *T2*	118	130	....	123	....	140	5.60	6.10
Houston *S2*	126	138	....	....	....	....	5.70	6.15
Johnstn., Pa. *B3*	118	130	....	....	140	....	5.70	6.15
Joliet, Ill. *A5*	118	130	....	123	....	140	5.70	6.15
Kokomo, Ind. *C9*	120	132	....	125	138	142	5.80	6.05
Los Angeles *B2*	....	....	....	....	....	....	6.65	....
Kansas City *S2*	130	....	....	135	....	152	6.30	6.75
Minnequa *C6*	123	138	130	128	146	146	5.95	6.40
Monessen *P6*	124	135	....	....	....	145	5.95	6.40
Moline, Ill. *R3*	....	....	136	....	....	....	....	....
Pittsburg, Cal. *C7*	137	....	....	147	156	160	6.65	6.90
Portsmouth *P7*	124	137	....	....	147	147	6.10	6.60
Rankin, Pa. *A5*	118	130	....	....	140	140	5.70	6.15
So. Chicago *R3*	118	126	140	123	....	136	5.70	5.95
S. San Fran. *C6*	....	....	....	147	....	160	6.65	7.10
Sparrows Pt. *B3*	120	....	....	125	142	142	5.80	6.25
Sterling, Ill. *N4*	118	130	....	123	140	140	5.70	6.15
Struthers, O. *Y1*	....	....	....	....	....	....	5.70	6.15
Torrance, Cal. *C7*	138	....	....	....	....	....	6.65	....
Worcester *A5*	124	....	....	....	....	....	6.00	6.45
Williamsport, Pa. *S10*	....	....	150	....	....	....	....	....

Cut Nails carloads, base $7.35 per 100 lb. (base 20¢ to jobbers), at Conshohocken, Pa., (*A2*), Wheeling, W. Va. (*W5*), $7.15.

* Alabama City and So. Chicago don't include zinc extra

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Axles	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	3.60	4.00	4.70	....	....	....	....	....
Chicago *R3*	....	....	....	6.15	....	....	....	....
Cleveland *R3*	....	....	....	....	....	9.35	....	....
Ensley *T2*	3.60	4.00	....	....	....	....	4.50	9.80
Fairfield *T2*	....	4.00	4.70	6.15	5.60	....	4.50	....
Gary *U1*	3.60	4.00	....	....	....	....	4.50	....
Ind. Harbor *I3*	3.60	....	4.70	6.15	5.60	....	4.50	....
Johnstown *B3*	....	4.00	....	....	5.60	....	....	....
Joliet *U1*	....	4.00	4.70	....	....	....	....	9.85
Kansas City *S2*	....	....	....	6.40	....	....	....	....
Lackawanna *B3*	3.60	4.00	4.70	....	....	....	4.50	....
Lebanon *B3*	....	....	....	6.15	....	9.35	....	9.85
Minnequa *C6*	3.60	4.50	4.70	6.15	....	....	4.50	9.85
Pittsburgh *R3*	....	....	....	....	....	9.35	....	....
Pittsburgh *O1*	....	....	....	....	....	9.35	....	9.85
Pittsburgh *P5*	....	....	....	....	....	....	....	9.85
Pittsburgh *J3*	....	....	....	6.15	....	....	....	....
Pitts., Cal. *C7*	....	....	....	....	....	....	4.65	....
Seattle *B2*	....	....	....	6.65	....	....	4.65	....
Stockton *B3*	3.60	....	4.70	....	....	....	4.50	....
Struthers *Y1*	....	....	....	6.15	....	....	....	....
Torrance *C7*	....	....	....	....	....	....	4.65	....
Youngstown *R3*	....	....	....	6.15	....	....	....	....

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.505
18	4	1	—	5	$2.13
18	4	2	—	—	$1.65
1.5	4	1.5	8	—	81.0¢
6	4	2	6	—	96.5¢

High-carbon chromium ..... 63.5¢
Oil hardened manganese ..... 35¢
Special carbon ..... 32.5¢
Extra carbon ..... 27¢
Regular carbon ..... 23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

CLAD STEEL

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct.		
Coatesville, Pa. *L4*	*29.5	
Washington, Pa. *J2*	*29.5	
Claymont, Del. *C4*	*28.00	
Conshohocken, Pa. *A2*		*27.50
New Castle, Ind. *I2*	*29.77	*26.24
Nickel-carbon		
10 pct Coatesville, Pa. *L4*	32.5	
Inconel-carbon		
10 pct Coatesville, Pa. *L4*	40.5	
Monel-carbon		
10 pct Coatesville, Pa. *L4*	33.5	
No. 302 Stainless-copper stainless, Carnegie, Pa. *A4*		77.00
Aluminized steel sheets, hot dip, Butler, Pa. *A7*		7.75

*Includes annealing and pickling, or sandblasting.

ELECTRODES

Cents per lb, f.o.b., plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
	GRAPHITE	
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	* 22.61
2½	24, 30	23.15
2	24, 30	25.36
	CARBON	
40	100, 110	8.03
35	65, 110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
20	84, 90	8.03
17	60, 72	8.03
14	60, 72	8.57
10, 12	60	8.84
8	60	9.10

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF_2 content:
70% or more $43.00
60% or less 40.00

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq.

Pct Off List

	Less Keg. Reg.	K.	Less Keg. Hvy.	K.
½ in. & smaller	15	28½	15	28½
9/16 in. & ⅝ in.	12	25	6½	21
¾ in. to 1⅛ in. inclusive	9	23	1	16½
1⅛ in. & larger	7½	22	1	16½

Nuts, Hot Pressed—Hexagon

½ in. & smaller	26	37	23	34
9/16 in. & ⅝ in.	16½	29½	6½	21
¾ in. to 1⅛ in. inclusive	12	25	2	17½
1⅛ in. & larger	8½	23	2	17½

Nuts, Cold Punched—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1⅛ in. inclusive	19½	31½	12	25
1⅛ in. & larger	8½	23	2	17½

Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
½ in. & smaller	35	45	28½	29½
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1⅛ in. inclusive	24	36	15	28½
1⅛ in. & larger	13	36	8½	23
	Light			
7/16 in. & smaller	35	45		
½ in. thus ⅝ in.	28½	39½		
¾ in. to 1⅛ in. inclusive	26	37		

Stove Bolts

Pct Off List

Packaged, steel, plain finished. 48—10
Packaged, plate finish ..... 31—10
Bulk, plain finish** 62*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets

Base per 100 lb

½ in. & larger $7.85

Cap and Set Screws

(In bulk) *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	54
¾ in. thru 1 in. up to & including 6 in.	48
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat	46
⅝ in. thru 1 in. up to & including 6 in.	41
Milled studs	35
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	53

Machine and Carriage Bolts

Pct Off List

	Less Case	C.
½ in. & smaller x 6 in. & shorter	15	28½
9/16 in. & ⅝ in. x 6 in. & shorter	18½	30½
¾ in. & larger x 6 in. & shorter	17½	29½
All diam. longer than 6 in.	14	27½
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	34	....

REFRACTORIES

Fire Clay Brick

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5) $94.60
No. 1 Ohio 88.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 88.00
No. 2 Ohio 79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) 13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala. $94.60
Childs, Pa. 99.00
Hays, Pa. 100.10
Chicago District 104.50
Western Utah and Calif. 111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago 111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 16.50
Silica cement, net ton, bulk, Hays, Pa. 18.70
Silica cement, net ton, bulk, Ensley, Ala. 17.60
Silica cement, net ton, bulk, Chicago District 17.60
Silica cement, net ton, bulk, Utah and Calif. 24.70

Chrome Brick

Per Net Ton

Standard chemically bonded Balt, Chester $82.00

Magnesite Brick

Standard, Baltimore $104.00
Chemically bonded, Baltimore 93.00

Grain Magnesite

St. ⅝-in. grains

Domestic, f.o.b. Baltimore in bulk fines removed $62.70
Domestic, f.o.b. Chewalah, Wash., in bulk 36.30
in sacks 41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ ... $13.75

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. 1952 prices not yet established. 1951 prices were:

Old range, bessemer	$8.70
Old range, nonbessemer	8.55
Mesabi, bessemer	8.45
Mesabi, nonbessemer	8.30
High phosphorus	8.30

After adjustments for analyses, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in Lake vessel rates, upper Lake rail freights, dock handling charges and taxes thereon.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.4¢ to 9.0¢
Canadian sponge iron, del'd, in East	10.00¢
Domestic sponge iron, 98+% Fe, carload lots	15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+% Fe	42.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	53.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe	83.0¢ to $1.48
Aluminum	31.5¢
Brass, 10 ton lots	30.00¢ to 33.25¢
Copper, electrolytic	10.75¢ plus metal value
Copper, reduced	10.00¢ plus metal value
Cadmium, 100-199 lb	95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity, del'd	$3.50
Lead	7.5¢ to 12.0¢ plus metal value
Manganese	57.0¢
Molybdenum, 99%	$2.75
Nickel, unannealed	88.0¢
Nickel, annealed	95.0¢
Nickel, spherical, unannealed	92.0¢
Silicon	38.5¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	83.00¢
Stainless steel, 316	$1.10
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$6.00
Zinc, 10 ton lots	23.0¢ to 30.5¢

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Compression Riveter Dies

Made to highest standards and uniform quality thus insuring maximum service.

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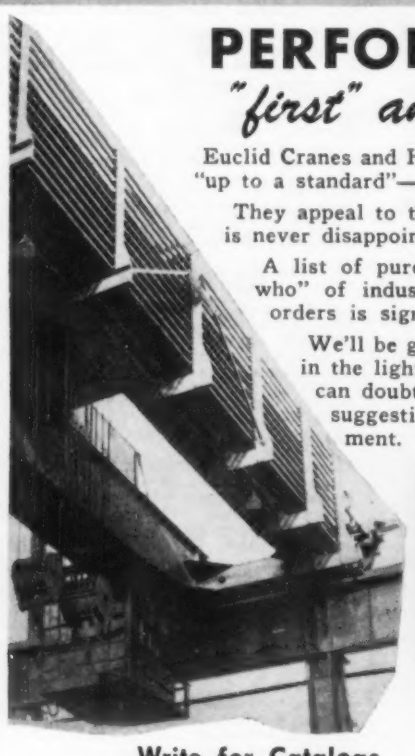

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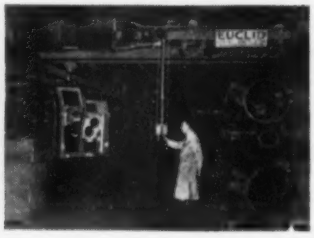
They appeal to the seeker for quality and he is never disappointed.

A list of purchasers reads like a "whose who" of industry. The record of repeat orders is significant and impressive.

We'll be glad to discuss your problems in the light of our long experience and can doubtless offer some constructive suggestions as to methods and equipment.



Write for Catalogs.

THE EUCLID CRANE & HOIST COMPANY

1361 CHARDON ROAD, EUCLID, OHIO

EUCLID CRANES AND HOISTS Raise Profits

—Ferroalloy Prices—

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk in carloads delivered. (65-72% Cr, 2% max. Si.)

0.06% C	30.50	0.20% C	29.50
0.10% C	30.00	0.50% C	29.25
0.15% C	29.75	1.00% C	29.00
2.00% C			28.75
65-69% Cr, 4-9% C			22.00
62-66% Cr, 4-6% C, 6-9% Si			22.00

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.50
Ton lots	22.75
Less ton lots	23.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	28.95
Less ton lots	31.85

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.14
0.50% max. C	1.30
9 to 11% C	1.40

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	21.30
Less ton lots	23.30

CMSZ

Contract price, cents per lb of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	20.75
Less ton lots	22.00

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50
Less ton lots	17.75

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.00
Ton lots to carload packed	19.00
Less ton lots	20.50

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size.

F.o.b. Niagara Falls, Alloy, W. Va., Ashtabula, O.	$185
F.o.b. Johnstown, Pa.	$187
F.o.b. Sheridan, Pa.	$189
F.o.b. Etna, Clairton, Pa.	$190

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.90
Ton lots	12.55

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a little engineering
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and...
low temperature
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MADE THIS MUSICAL INSTRUMENT PART FOR MARTIN BAND INSTRUMENT CO. TO PRECISION TOLERANCES... FAST... NEAT... INDESTRUCTIBLE... AT LOW COST. 20 BRAZED JOINTS... ONE SINGLE OPERATION... IN 80 SECONDS.

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—Ferroalloys—

Continued

Spiegeleisen

Contract prices gross ton; lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$74.00	$75.00
Pbh. or Chicago	74.00	75.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	34.75
Ton lots	36.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.7% max. C, 0.06% P, 90% Mn	26.25	28.10	29.30
0.07% max. C	25.75	27.60	28.80
0.15% max. C	25.25	27.10	28.30
0.30% max. C	24.75	26.60	27.80
0.50% max. C	24.25	26.10	27.30
0.75% max. C 7.00% max. Si	21.25	23.10	24.30

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carloads	9.90
Ton lots	11.30

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.15

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn 19.15¢

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	9.90
Ton lots	11.55
Briquet, contract basis carlots, bulk delivered, per lb of briquet	11.15
Ton lots	12.75

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $90.00. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	21.70
97% Si, 1% Fe	22.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90.95% Si			17.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

STIEGEL

BARON VON STIEGEL

The name Baron Stiegel means to fine glass what Universal means to precision balls. In both—highest quality is the first consideration. As Stiegel combined fine artistry with manufacture and distinguished his glass from all the rest, research, science and careful manufacture distinguish Universal Balls all over the world.

Today Universal precision balls are made to within ten millionths of an inch perfect spheres. They are 100% inspected and individually gauged. So, where high speeds, silent operation and minimum torsional resistance are determining factors you can place full confidence in Universal Balls.

Specify Universal Balls for unexcelled surface finish, sphericity, size accuracy and extremely fine tolerances.

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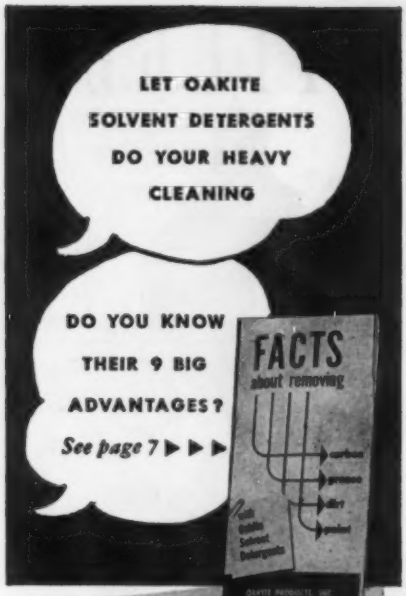

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- **Precleaning before painting or plating**
- **Stripping paint**
- **Providing temporary protection against rust**
- **How to use Oakite solvent detergents:**
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  - Soak-tank method
  - Spray-rinse method
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—Other Ferroalloys—

Ferrocolumbium, 50-60% 2 in. x D, contract basis, delivered, per pound contained Cb.
Ton lots $4.90
Less ton lots 4.95

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $3.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo. $1.32

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload $75.00

Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots 1.55

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $177.00

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W5, ton lots, delivered $5.00

Ferrovanadium, 35-55% contract basis, delivered, per pound, contained V.
Openhearth ..... $3.00-$3.10
Crucible 3.10- 3.20
High speed steel (Primos) 3.20- 3.25

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
Carload, bulk lump ..... 14.50¢
Ton lots, bulk lump ..... 15.75¢
Less ton lots, lump ..... 16.25¢

Vanadium Pentoxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.28

Zirconium, 35-40%, contract basis f.o.b. plant, freight allowed, per pound of alloy.
Ton lots ..... 21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
Carload, bulk ..... 7.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B.... $5.25

Bortam, f.o.b. Niagara Falls
Ton lots, per pound ..... 45¢
Les ton lots, per pound.... 50¢

Corbortam, Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
Ton lots, per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots.... $1.20
F.o.b. Wash., Pa.; 100 lb up
10 to 14% B ..... .85
14 to 19% B 1.30
19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.
No. 1 ..... $1.00
No. 6 ..... 68¢
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
Ton lots $1.46
Less ton lots 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.
Less ton lots $1.80

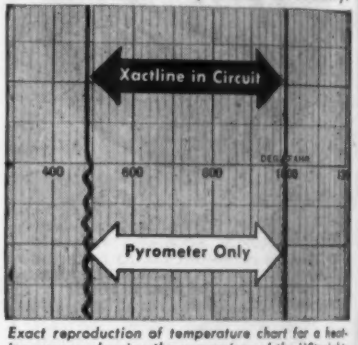
Silcaz, contract basis, delivered.
Ton lots ..... 45.00¢

Automatic "STRAIGHT-LINE" TEMPERATURE CONTROL with XACTLINE

ELIMINATE Overshooting Undershooting

Are you going to continue to put up with that troublesome overshooting and undershooting inherent in your conventional pyrometer control—especially when it is so easy to eliminate that saw-tooth effect?

Put XACTLINE in the control circuit. XACTLINE anticipates the temperature changes—before they occur. And too, it nullifies the varying amounts of thermal lag, residual heat, and mechanical lag—producing a short on-off cycle resulting in "Straight-Line" temperature control. This performance is possible because there is no dependence upon mechanical parts—XACTLINE operates electrically.



Exact reproduction of temperature chart for a heating process showing the comparison of the "Straight-Line" temperature control produced by XACTLINE and the saw-tooth curve obtained with only conventional control.

XACTLINE is applicable to any indicating or recording pyrometer control of the millivoltmeter or potentiometer type. It should be used wherever close temperature control is required—any type of electrically heated oven, furnace, kiln, injection molding machine, and fuel-fired furnaces equipped with motor-operated or solenoid valves.

XACTLINE is a complete unit. No adjustment or coordination with the control instrument is required regardless of the size of the furnace, length of the heating cycle, or size of the load. Installation is very simple—can be either flush or surface mounted.

PRICE **$89.50** F.O.B. CHICAGO
Nothing else to Buy

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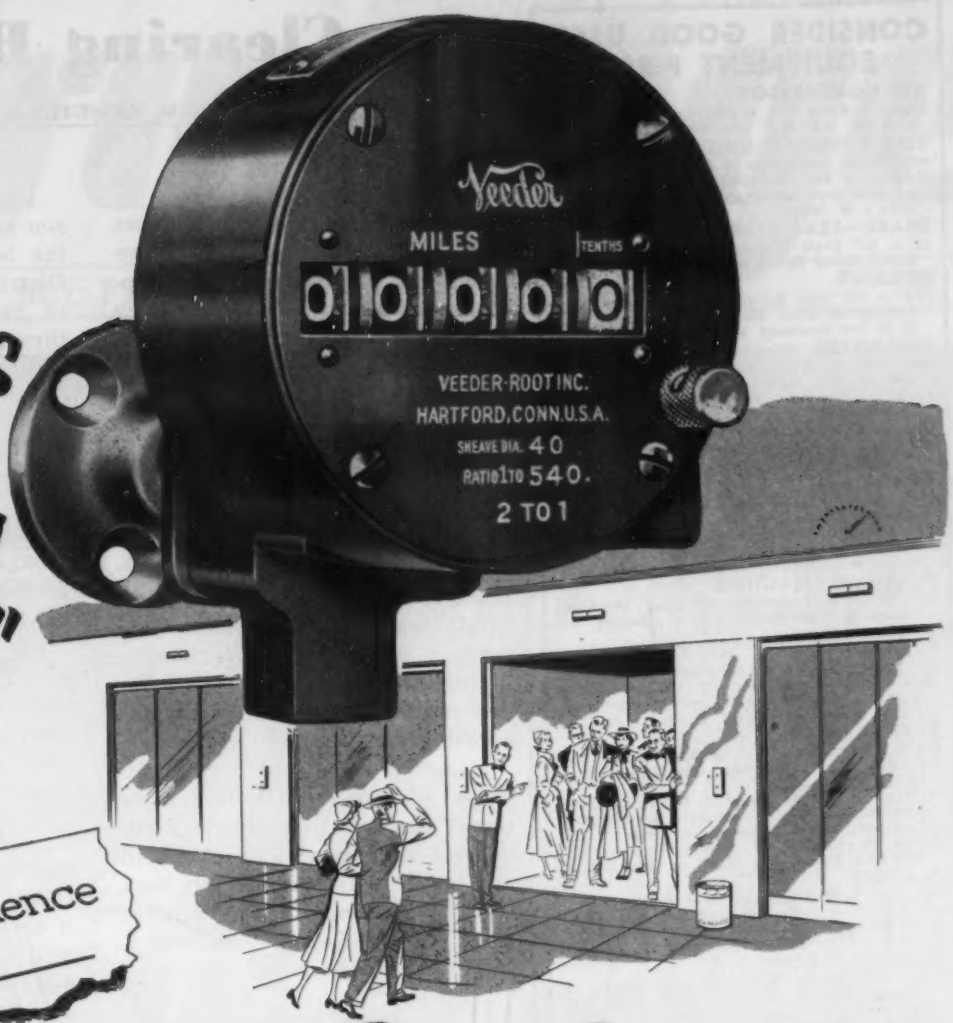

It counts your UPS and DOWNS"

Added Evidence that—

Everyone Can Count on VEEDER-ROOT

Elevator Mileage Recorders give accurate figures on vertical miles . . . so that it can be plainly seen...*in advance*...when it's time to replace cables, overhaul cars, motors, and what have *you . . . including your life.*

Yes, the V-R wheelmark monogram protects millions of people daily, from the depths of the sea to the stratosphere. Of course, not all V-R Products and services are available nowadays . . . but if your work counts importantly in defense, then you can count on Veeder-Root to help you, as soon as rush commitments permit.

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"Counts Everything on Earth"

CONSIDER GOOD USED EQUIPMENT FIRST

AIR COMPRESSOR
Ingersoll Rand 33" x 20½" x 24" Complete with 635 H.P. G.E. Syn. Motor 2300/3/60.

BELT GRINDING UNIT
Hill Clutch & Machine & Fdy. Co. Open Side Abrasive Belt Grinding Unit, Designed to accommodate slabs up to ⅜" thick x 30" wide x 30' long.

BRAKE—LEAF TYPE
16' x ¾" Dreis & Krump Leaf Type Bending Brake, Motor Driven with 40 H.P. A.C. Motor.

BUILDING
72'6" x 140' Steel Building—NEW—Designed for Corrugated Steel Siding and to carry load of 30 ton overhead electric traveling crane.

BULLDOZER
#9 William White Bulldozer, Motor Driven with 50 H.P. Motor, 440 v. 3 ph. 60 cycle. Face of Crosshead 20" x 90". Movement of Crosshead 24".

CHARGING MACHINE
3½ Ton Wellman-Seaver-Morgan Revolving Charging Machine—Floor Type.

CRANES
5 ton Niles Crane 56' 3⅜" Span. Three motors, 440 volt, 3 phase, 60 cycle.
25 ton P&H Crane 80' Span, With 5 ton Auxiliary Four Motors 440 volt 3 phase 60 cycle. Built 1942-43 for outdoor service.

FLANGING MACHINE
¾" McCabe Pneumatic Flanging Machine, Pneumatic Holddowns, Circle Flanging Attachment.

FURNACE—BILLET HEATING
Surface Combustion Super Fast Heating Furnace Tangential Burner, 3 Section, Pusher Capacity 3600 lb. per hr. gross, Max. Temp. 2750° F. Complete Elecl. Equip.

FURNACES—MELTING
400 lb. Moore Type "UT" Melting Furnace Top Charge. Complete with Transformer. New 1943—Little Used.
15 ton Heroult Model V-12 Electric Melting Furnace Top Charge hydraulically operated. Complete with Transformer Equipment.
25 ton Moore Size "NT" Melting Furnace, with 7500 KVA Transformer 13,200 vo. 3 ph. 60 cy.

PLANERS
48" x 48" x 20' Cincinnati, Four Head
48" x 48" x 12' Niles-Bement-Pond, Four Head
60" x 60" x 12' Niles-Bement-Pond, Four Head
72" x 72" x 12' Niles-Bement-Pond, Four Head

PLATING MACHINE
Type "B" Crown Full Automatic Nickel & Chrome Plating Machine, Max. Work Size 14" wide x 36" deep x 4" thick.

PRESS—KNUCKLE JOINT
1000 ton Bliss #27 Knuckle Joint, Embossing & Coining Press, 2½" stroke, 18" Shut Height.

ROLLING MILLS
8" x 10" Schmitz Single Stand Two High With Friction Drive Rewinder.
12½" x 16" Philadelphia Two High Cold Rolling Mill. Complete with Pinion Stand, 75 H.P Motor 440/3/60. Starter and Controls, Incl. Coiler.
12¼" x 20" Waterbury Farrel Single Stand Two High. Complete with Gear Reducer and 50 H.P. A.C. Motor.
18" x 24" Waterbury Farrel Two Stand Two High Rolling Mill, Complete with Elec. Equip.

TESTING MACHINE
300,000 lb. SOUTHWARK-EMERY Universal Hydraulic Testing Machine.

TRIMMING LINE
#1049 Torrington Trimming Line, With Feed Rolls and Scrap Cutter. Capacity for steel or aluminum alloys 1/8" max. Trimmed width 22" min. 66" max. Scrap Length ¾" min. 2¼" max.

UNIVERSAL IRONWORKERS
Ryerson Steel Frame Universal Iron Worker, M.D., Capacity Punch ⅝" thru ⅞", Shear 1" Square, 1¼" Round, ½" x 4" Flat, 4 x 4 x ¼" Angles
No. 28U-30 Buffalo Armor Plate Universal Ironworker—Combination Punch, Shear & Bar Cutter, Motor Driven Capacities:—Shear 3" Round, 2⅝" Square, 5x5x⅝" Angles 45°, Flats 5 x 1⅝", 12"—31½# Beams, 12—30# Channels, Punch 1½" thru 1¼".

WELDERS
700 KVA Federal Flash Welder, Enclosed Rim Type, 440 Volt, Single Phase, Ring Sizes 6" to 35" Diameter x 12" Wide.
40 KVA Sciaky, Spot Welder, 36" Throat 440/3/60 operation.
250 KVA Progressive Model A-6 Flash Welder 440 volt 60 cycle, Mechanical Contractor Hi-Pressure Clamp Assembly—NEW 1949.

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The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINER

Off Key—Used machine tool men continue to sing the no-business-blues. But the used electric equipment and repair service industry appears to be in better shape, though volume is spotty.

All dealers in the electrical field report they are still on the downhill slide from the frenetic buying period that came shortly after the Korean outbreak. Generally speaking there is no movement of medium size motors and greatest demand is for special equipment. Stretching out of the defense program is hurting as it gives manufacturers more time to wait for new units which are becoming increasingly available.

Spot Checks—New York dealers report business to be fairly good. Control equipment is in demand and repair work is at a fairly high level. Reflecting the nationwide trend, however, there has been a tailing-off in requests for used motors.

In Pittsburgh one large electrical equipment dealer reports government orders are offsetting loss of business due to the steel strike and coal mine shutdowns. Most of the government orders are for special equipment to be used in atomic research. Included are transformers, and generator sets for testing purposes and power generation. Gas engine generator sets are also in demand as standby equipment.

Canadian Push—A freak bright spot for electrical repair shops has cropped up along the Canadian border near Ontario. Recent switch in Ontario's power system from 25 to 60 cycles has pepped up business since all electrical equipment has to be rewound. There are not enough repair shops in the area to handle the traffic, so much of the business has slipped across the border.

Another factor aiding business is the heat. The long hot spell which started early in the season has created what dealers ca the best fan season in 10 year Distributors' stocks of all typ of fans have been cleared o throughout the nation.

No Change—General Cable Cor does not plan to make any chang in its refund policy on magn wire spools despite the protest received from the National Servi Industrial Assn., a compan spokesman told IRON AGE. The a sociation objected to Genera Cable's policy of not giving full r funds on spools 24 in. and larg which are returned after months. It requested that the co pany offer full credit on retur made within 5 years of the pu chase date.

Credit Decreases — Gener Cable's current practice on larg spools is to give full refunds on if they are returned within a month period. After that a 5 p decrease in refund credit is ma every month until the spool is r turned. After 32 months no cred is given.

Reason behind this system probably the hope that it w speed up return of magnet wi spools which are in short supp Dealers say they return them soon as possible anyway since t empty reels are only a nuisan around the shop.

Small Shop Problem—NISA b lieves this refund policy is a har ship for small shops in which ma net wire is not used up ve quickly. General Cable stated th many reels are not returned wit in the 12-month period and that considerable number miss the 3 month deadline.

Price Book — Latest word fr the Office of Price Stabilization that the price book for used ma chine tool men will be out aft Labor Day. The delay means mo inconvenience but those in on t planning say it will be exactly wh the industry has wanted.